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Low-carbon living in a Finnish rural municipality: barriers and enablers

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Tiivistelmä - Referat - Abstract

Hiili-intensiivisistä elämäntavoista luopumisella on tärkeä rooli nykyisen ilmastokriisin torjuntatyössä. Erityinen merkitys sillä on Suomen kaltaisissa varakkaissa valtioissa, joissa kansalaisten hiilijalanjäljet ovat suuria. Elämäntapojen muuttaminen voi kuitenkin olla hankalaa, sillä monet tekijät vaikeuttavat uusien vähähiilisten tapojen omaksumista. Toisaalta myös tapojen muutosta edistäviä tekijöitä voi olla hankala tunnistaa. Näiden, usein esteiksi ja mahdollistajiksi, kutsuttujen tekijöiden merkitys ja valikoima voivat vaihdella erilaisten paikkojen välillä johtuen paikkojen uniikeista konteksteista. Esteiden ja mahdollistajien tutkiminen erilaisissa paikoissa auttaa tekemään päätöksiä siitä, miten vähähiilisten elämäntapojen omaksumista voitaisiin edistää näissä konteksteissa. Tässä tutkielmassa esteitä ja mahdollistajia tutkitaan Suomen maaseudun kontekstissa. Suomen maaseutuun usein liitettäviä piirteitä ovat muun muassa pitkät etäisyydet, palveluiden vähäisyys, konservatiivisuus ja yhteisöllisyys.

Tämän tutkielman tavoite oli tarkastella, minkälaisia vähähiilisten elämäntapojen esteitä ja mahdollistajia maaseudulla asuvat suomalaiset kokevat, ja mitkä näistä esteistä ja mahdollistajista ovat erityisen linkittyneitä maaseudun kontekstiin. Tutkielmaa varten haastateltiin kahdeksaa Kauhajoen kaupungin asukasta. Litteroitu haastatteluaineisto analysoitiin laadullisella sisällönanalyysillä. Aineistosta koodattiin esteitä ja mahdollistajia, ja muodostettiin 14 este- ja 13 mahdollistajakategoriaa.

Este- ja mahdollistajakategorioiden teemat vastasivat sisällöltään hyvin toisiaan. Esteet saivat enemmän mainintoja. Sekä esteet että mahdollistajat liittyivät muun muassa infrastruktuuriin, palvelujen ja tuotteiden saatavuuteen, aikaan, rahaan, tietoon, terveyteen, sosiaaliseen ympäristöön, tapojen muodostumiseen, elämäntilanteeseen, tunteisiin sekä käsityksiin helppoudesta tai vaikeudesta. Ne kumpusivat osallistujien psykologisista prosesseista ja henkilökohtaisista elämistä, heidän omaamistaan resursseista sekä heitä ympäröivästä fyysisestä ja sosiaalisesta ympäristöstä. Maaseudun kontekstiin linkittyvät esteet ja mahdollistajat koskivat etenkin infrastruktuuria ja saatavuutta.

Tulosten perusteella maaseudun asukkaat elävät monimutkaisessa esteiden ja mahdollistajien muodostamassa vastakohtaisuuksien ympäristössä. Koska esteitä näytetään tunnistavan helpommin, on tärkeää, että mahdollistajia pyrittäisiin korostamaan. Vaikka maaseudulla fyysiseen ympäristöön liittyvät esteet ja mahdollistajat ovat helpoiten havaittavissa, huomiota tulisi kiinnittää niihin kaikkiin, jotta muutospotentiaalia ei tuhlattaisi. Tutkielman tulokset auttavat tunnistamaan sekä vähähiilistä elämäntapamuutosta häiritseviä esteitä että sitä eteenpäin auttavia mahdollistajia Suomen maaseudulla.

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Abandoning carbon intensive lifestyles plays an integral role in mitigating the current climate crisis, especially in wealthy countries such as Finland where citizens' carbon footprints are large. Mitigative lifestyle change can however be hard as many factors hinder the adoption of low-carbon practices. It can also be hard to recognize factors that could push lifestyle change forward. The significance and range of these factors, often called barriers and enablers, can vary between different places as each place constitutes its unique context. Studying barriers and enablers in different places can help us decide how to best advance the adoption of low-carbon practices in these contexts. In this thesis barriers and enablers are examined in the context of rural Finland. Characteristics that are often connected to rural Finland include long distances, scarcer services, conservativeness, and communality.

The aim of this study was to examine what kinds of barriers to and enablers of low-carbon lifestyle change people dwelling in rural Finland experience, and which of these barriers and enablers have special links to the rural context. Eight citizens of Kauhajoki municipality were interviewed. The transcribed interview data was analysed with qualitative content analysis. Barriers and enablers were coded from the data, and 14 barrier and 13 enabler categories were formed.

The themes of the barrier and enabler categories coincided well in terms of their content. Barriers were mentioned more often. Both barriers and enablers included factors related to infrastructure, availability of services and products, time, money, knowledge, health, social environment, habit formation, life situation, feelings, and perceptions of difficulty or easiness. They stemmed from the participants' psychological processes and personal lives, the resources they had, and the physical and social aspects of their environment. Barriers and enablers with links to the rural context were most abundantly connected to infrastructure and availability.

Based on the results, rural citizens live in a complicated push-pull environment of different barriers and enablers. Given that barriers appear to be more easily identified, it is important to start highlighting enablers. Even though in rural areas barriers and enablers related to the physical environment are most visible, attention should be paid to all factors to ensure that no potential for change is wasted. The results of this thesis help recognize both hurdles and helpers of low-carbon lifestyle change in rural Finland.

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Ilmastonmuutos, elämäntapojen muutos, vähähiiliset tavat, esteet, mahdollistajat, maaseutu

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Abbreviations

GSHP	Ground source heat pump
IGES	Institute for Global Environmental Strategies
IPCC	Intergovernmental Panel on Climate Change

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1 Introduction

Today it is globally recognized that we are facing perhaps the biggest challenge that humankind has ever faced: climate change. Climate change, caused by increasing greenhouse gas concentrations in the atmosphere that are attributable to fossil fuel-based economies and changing land use patterns, is threatening lives and livelihoods all around the globe. Rising sea levels, more frequent occurrences of extreme weather events, droughts and floods and subsequent food shortages among several other dire consequences pose risks to the well-being of human societies, especially in areas where existing climate conditions and socio-economic circumstances already put pressure on human activity (Intergovernmental Panel on Climate Change [IPCC], 2018). Given the scope of the crisis at hand, many strands of discourse are connected to the issue of climate change, among them a widespread conversation about responsibility and accountability (Stoddart, Tindall, & Greenfield, 2012), and the consequent issue of who has to change their ways and on what terms.

A multitude of different actors are related to the discussion about responsibility ranging from international coalitions to governments of nation states, corporations, non-profit organizations, and individual citizens. Even IPCC (2018) states that to ensure the impact of climate change mitigation efforts, all levels of society need to work together. The interconnectedness of the accountability of different actors is identified by citizens as well, for example in respect of the two-way relationship between government actions and individual lifestyle change: people see the need for governments to push their citizens toward more climate-friendly ways of living and, vice versa, there is a need for citizens to put pressure on governmental decision-making (Stoddart et al., 2012; Tvinnereim, Fløttum, Gjerstad, Johannesson, & Nordø, 2017).

In this thesis I will focus on individual citizens as actors in the sphere of climate change mitigation. Lifestyles of individuals have a significant role in solving the climate crisis. Up to 72 per cent of global greenhouse gas emissions can be attributed to consumption on the household level (Hertwich & Peters, 2009). Issues connected to the behaviour of citizens such as consumption patterns, worldviews and common perceptions have their place amongst the key drivers that exacerbate unsustainable resource use (Hirschnitz-

Garbers, Tan, Gradmann, & Srebotnjak, 2016). Citizens of prosperous Western countries exhibit exceptionally high levels of lifestyle carbon emission loads (Hubacek et al., 2017; Institute for Global Environmental Strategies [IGES], Aalto University, & D-mat ltd, 2019). For example, according to IGES et al. (2019) the average per capita carbon footprint of a person residing in Finland is approximately five times the size of the average carbon footprint of a citizen of India (Finland: 10,4 t CO_2e and India: 2,0 t CO_2e). The situation in Western countries such as Finland is starkly illustrated by the aforementioned study as they calculated that without any significant emergence of negative emissions technologies to curb emissions, a global per capita target footprint of 2,5 t CO_2e for the year 2030 would be needed to achieve current climate goals. The scope of the required reduction may be difficult to envision in practice, but at the very least results such as these highlight the imperative to reconsider Western high-carbon lifestyles.

Changing lifestyles in such a radical way is not easy. Even people who identify as environmentally conscious and have intentions to adopt low-carbon practices can find it difficult to do so (Newton & Meyer, 2013). It is almost universally recognized that lifestyle changes do not usually happen in a void of free choice but are instead embedded in a web of other factors that exist outside the internal motivations of individuals (Jackson & Smith, 2018). So, the question remains: what aspects of our daily life are at odds with the pursuit of low-carbon lifestyles?

Authors of literature concentrating on uncovering these aspects have found a multitude of barriers related to environmentally beneficial lifestyle change that embody for example psychological, social, economic, habitual, and physical dimensions of life (for example, Gifford, 2011; González-Hernández, Meijles, & Vanclay, 2019; Lorenzoni, Nicholson-Cole, & Whitmarsh, 2007). However, limiting the discussion only to aspects that inhibit us from adopting climate-friendly practices is essentially to focus only on what is wrong and should be fixed. Enablers or drivers are factors that help people in their pursuit of practicing low-carbon lifestyles and can be as varied as barriers (Axon, 2017). Looking at both what obstructs people and what pushes them forward on their journey toward low-carbon lifestyle change yields a more balanced analysis than looking purely at what is amiss.

Although academic literature especially on barriers to lifestyle change is rich, there is use in examining barriers and enablers in different local contexts as having localized

knowledge helps identify which issues and possibilities should be given specific attention in specific places (Axon, 2017). The place where we live in has the potential to structure our lives in particular ways, making certain changes easier and others more difficult (Siirilä et al., 2013). It is therefore crucial to understand what barriers to and enablers of action are present in a given place.

In this thesis I have decided to focus on the Finnish rural area as a distinct place of residence. Even though under 30 % of Finns live in areas classified as rural, rural areas cover over 90 % of Finland (Helminen, Nurmio, & Vesanen, 2020). Given Finland's globally ambitious climate targets (Prime Minister Sanna Marin's Government, 2019) climate action is becoming an integral part of the everyday life of people dwelling both in urban and rural areas. Therefore, it is important to understand the conditions of adopting climate-friendly practices that people in these different residential areas perceive to be relevant. Although the issue of sustainable lifestyles has been studied in the context of Finnish countryside for example by Siirilä et al. (2013) and Ovaskainen (2019) I feel that the discussion has room for a balanced look at both barriers and enablers focusing on climate-smart low-carbon practices.

Examining the situation of low-carbon lifestyles in rural areas is justifiable also from a perspective of fairness. In the climate change discourse, the role of rural areas can sometimes be reduced to discussions over agriculture which consequently omits the significance of the wider rural population who do not work in primary production. Also, rural areas are often connected to the demonization of individual high-carbon practices especially private driving which in turn gives a relatively lacking visualization of all the possibilities for change that could be utilized in these areas. Deficient discussion can in turn lead to reduced imagination as to what should and can be done in rural areas in order to guide their citizens into more low-carbon directions. From an ethical point of view, it is important to enrich the discourse and give rural people a fair possibility to participate in the discussions over the challenges and possibilities of low-carbon lifestyles. If this is not done properly, we arrive at an ethically dubious situation where our goals of achieving lifestyle change and the means through which we aim to get there ignore the circumstances of certain parts of the population.

It should be noted that there is no one type of rural area. There are however some common characteristics that are often connected to rural living such as long distances, the sparsity

of services, smaller population density, the closeness of nature, privacy and proximity to livelihoods based upon the utilization of natural resources. The cultural climate has traditionally been perceived as more conservative or narrow-minded than in urban areas. On the other hand, ideas of a sense of community and acts of voluntary work within communities have been linked to rural areas (Malmsten, 2004).

My thesis aims to contribute to the literature on barriers to and enablers of low-carbon lifestyle change in the context of rural municipalities of Finland which the municipality of Kauhajoki was chosen to represent. Qualitative methods were used for both data collection and analysis. Eight residents of Kauhajoki municipality with positive environmental attitudes were interviewed. The interview data was analysed with qualitative content analysis.

The research questions this study focuses on are the following two:

1) What barriers do people living in Kauhajoki face when trying to implement low-carbon practices into their lifestyles?
2) What enables people living in Kauhajoki to implement low-carbon practices into their lifestyles?

The next chapter offers a concise look at the literature on low-carbon practices and lifestyles, barriers to and enablers of adopting low-carbon and sustainable practices, and the characteristics of the Finnish rural context. In Chapter 3 I return to the research design of this study. Next, in Chapter 4 the methods of data collection and analysis are recounted in addition to some ethical considerations. The results of the study can be found in Chapter 5 while the analysis of these results along with some limitations of the study are presented in Chapter 6. The final chapter offers a summary of the conclusions born out of this study.

2 Literature review

In this chapter scientific literature on the main three themes of the thesis will be presented: low-carbon lifestyles, barriers and enablers related to sustainable and low-carbon lifestyle change, and rural areas. We will begin by recounting why low-carbon lifestyles are important and what can they consist of. After that the role of barriers and enablers in behaviour change is discussed along with some examples. Lastly, characteristics of rural areas and some links between low-carbon living and these areas are presented.

2.1 On lifestyles

Within the climate change discourse, the subject of lifestyles is relevant both in terms of adapting to and mitigating climate change. In wealthy countries it is reasonable to focus especially on the mitigative potential of lifestyles as the per capita greenhouse gas emissions are high (Hubacek et al., 2017). In Finland there is "much room to improve" as the per capita carbon footprints should in light of current international climate targets be reduced by up to 90 % (IGES et al., 2019). Given this imperative to act, new ways of living must be imagined, ways that are based on an enhanced focus on climate-smart sustainability.

The concept of a lifestyle aims to describe the ways in which we live. Embracing a certain type of lifestyle can make us different from one another, and on the other hand, connect us to other people. A commonly cited definition by Giddens (1991) states that lifestyles are a tool of narrating one's self-identity by embracing clusters of social practices that reproduce a certain way of living (as cited in Evans & Abrahamse, 2009). In their extensive look at different definitions of lifestyles Jackson and Smith (2018) differentiate between four approaches: lifestyles as livelihoods, lifestyles as the pursuit for life satisfaction, lifestyles as a social conversation, and lifestyles as locked in. The fourth approach of locked-in lifestyles directs attention away from an individual forging their own self-identity and instead to the "outside", to what is surrounding the individual. In it, lifestyles are seen as confined to certain paths that are dependent also on other factors apart from the free choice of an individual, such as the social, economic, physical, and habitual aspects of ordinary life. In this thesis these aspects and the locked-in nature of

lifestyles manifest themselves in the form of barriers and enablers to which we will return to later.

2.2 The building blocks of low-carbon lifestyles

When looking at lifestyles from the perspective of climate change, certain aspects of living appear more carbon-intensive than others. Well-acknowledged domains emerge at the nexus of climate impacts and the lifestyles of individuals living in affluent countries: housing, mobility, and diet (IGES et al., 2019). In Finland up to three fourths of the lifestyle carbon load of an average citizen consists of emissions stemming from these three domains (Sitra, 2019). The so-called carbon emissions hotspots within these domains include utilizing fossil-fuel based energy, private driving, flying, and eating meat and dairy products (IGES et al., 2019).

In tackling the emission-heavy domains of lifestyles an often-used approach is to find alternative practices with which to replace the current carbon-intensive ones (for example, IGES et al., 2019; Gardner & Stern, 2008). These alternative practices with lower carbon emission intensities are often simply called low-carbon practices. Picture 1, content of which is based on the work of IGES et al. (2019), showcases a selection of low-carbon practices with the greatest emission reduction potentials in terms of Finnish lifestyles. However, I will not discuss individual low-carbon practices in more detail as providing a deeper overview of just the three domains of housing, mobility, and diet would take up a lot of space. I have utilized the Finnish Innovation Fund Sitra's comprehensive listing of different sustainable practices (100 smart ways to live sustainably-website) as proxies of low-carbon practices in the interviews conducted for this thesis (Sitra, n.d.-a). The lists of low-carbon practices prepared for the interviews can be found in Appendix 1. I will return to this matter in the Methods section.

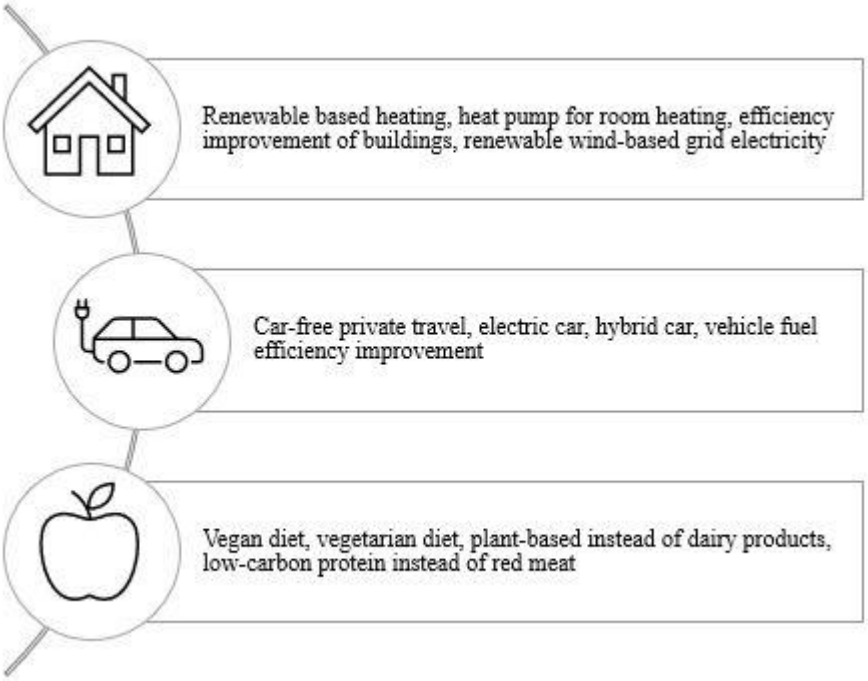

Figure 1. Low-carbon practices with the highest emission reduction potentials in the lifestyle of an average Finn

Even though individual low-carbon practices will not be recounted here, something could be said about how these practices can be classified into distinct typologies. Schanes, Giljum and Hertwich (2016) offer a broad look at mitigation strategies within which different types of mitigative lifestyle practices fall into. They present a framework with four main categories, all of which aim at the reduction of lifestyle-based carbon emissions: direct reduction, indirect reduction, direct improvement, and indirect improvement. Each of these categories entails one or several strategies and sub-strategies. For example, the low-carbon practice of ride-sharing would be situated in the category of "indirect reduction" and within it into the improvement strategy of "changes in using behaviour" and the sub-strategy of "sharing/renting". On the other hand, the action of acquiring a new electric car situates itself into the category of "direct improvement" and within it into the "purchase of products that are more efficient in use" strategy and the sub-strategy of "carbon intensity".

Frameworks such as the one by Schanes et al. (2016) help to highlight the contrast between practices of more efficient consumption that are made possible by technological and other types of product-focused innovation (situated under the improvement categories) and practices that may require deeper change to the ways in which everyday

life is structured (under the reduction categories). The consequent distinction of efficiency improvement and absolute reduction is widely discussed within conversations on sustainable lifestyles (Jackson & Smith, 2018). The distinction is said to be useful in comparing how impactful different mitigative lifestyle measures are: for example, in the sectors of domestic energy usage and mobility of individuals, measures focusing on (energy) efficiency appear to be incapable to provide the needed emission reductions which indicates that more deep-cutting changes are needed (Moriarty & Honnery, 2019). Conversely, Gardner and Stern (2008) found out that practices focusing on energy efficiency were more energy saving than practices limiting the use of more inefficient gear. In addition to absolute reduction and efficiency improvements IGES et al. (2019) recognize a separate category of modal shift meaning cases where the mode of consumption is swapped to a more low-carbon alternative, for example, when meat is substituted with protein-rich plant-based products. There are then a variety of typologies within which the cavalcade of low-carbon practices can be placed.

Even though much research on the impact of different low-carbon practices exists, individuals can find it difficult to recognize practices that have the potential to create the largest emission savings in their individual lifestyle circumstances (Whitmarsh, 2009). In some cases, this might be due to different institutions recommending practices with relatively lower emission reduction potentials (Wynes & Nicholas, 2017). Even if the "right" practices are recommended, and individuals have knowledge of different low-carbon practices and are motivated to act climate-friendly it might be hard for them to infuse their current lifestyles with low-carbon practices. In the next chapter I will discuss why this is the case and what can be done about it.

2.3 Adopting low-carbon practices: barriers and enablers

As mentioned at the end of the last chapter individuals can find it hard to adopt low-carbon practices even if they are willing to act for the good of the environment and the climate. This is where the concept of barriers comes into play. When discussing barriers to behaviour change it can be beneficial to also examine possibilities of change, i.e., what things might help push people to adopt low-carbon practices despite the existence of barriers. In this thesis these possibilities are called enablers. During this chapter barriers to and enablers of environmentally-friendly lifestyle change are discussed. First, the focus

on both types of factors is justified after which some barriers and enablers from earlier similar studies are presented.

2.3.1 A balanced analysis

Simply put, barriers are factors that somehow hamper or obstruct behaviour change, in this case towards more low-carbon directions. They differ from limits given that the term limit is often used when describing a factor that cannot be overcome while barriers can. These distinctions are discussed to a great extent in literature on climate change adaptation (Moser & Ekstrom, 2010) but seem to appear less in literature focusing on the mitigative potential of lifestyles.

The main indicator for the existence of action-hindering barriers comes from the perceived existence of a value-action gap (or attitude-behaviour gap). Value-action gap means the gap that presents itself when an individual's attitudes, values, or level of awareness concerning issues such as climate change do not correspond to their actual behaviour or behavioural intent regarding these issues (Kollmuss & Agyeman, 2002; Newton & Meyer, 2013). What can be derived from the existence of the gap is that other factors in addition to attitudes or concern for the environment have explanatory force behind people's realized behaviour with respect to sustainability. Some criticize this type of approach to behavioural change and as Shove (2010, p. 1276) critically remarks, the existence of the value-action gap is "only mystifying if we suppose that values do (or should) translate into action". Despite the critique directed towards using the gap as a theoretical starting point, the existence and relevance of the gap are taken for granted in this study and integrated into the research design as will be shown in later chapters.

As a contradictory force to barriers, enablers or drivers mean factors that make changes in behaviour possible. They enable behaviour change by pushing people toward, in this case, low-carbon practices. According to my personal observation, literature on enablers of sustainable lifestyle change is in shorter supply than literature on barriers. Literature touching on them both at the same time is also sparse although some such papers can be found for example by Graça, Godinho, & Truninger (2019) and Axon (2017). Still, there is more demand for studies that look at both types of factors side by side. My thesis aims

to answer this demand by examining in a balanced manner both barriers to and enablers of adopting low-carbon practices.

A more balanced view has been called for when it comes to other aspects of reporting barriers and enablers as well. In a study by Graça et al. (2019a) the authors utilized a model of behaviour called the COM-B system of behaviour to structure the results of their literature review regarding barriers and enablers associated with plant-based eating. In the COM-B model three components have to act in coordination so that practices can be changed in an enduring way: capability, opportunity and motivation (Michie, Atkins, & West, 2014, as cited in Graça et al., 2019a). As described by Graça et al. (2019a) capability refers to psychological and physical characteristics that are needed to behave in a certain way (for example, knowledge and skills), opportunity to physical and social environment in which behaviour happens (for example, what is socially accepted or what products are available), and motivation to internal psychological processes (for example, attitudes and feelings). According to their results barriers and enablers that act as motivation components were overrepresented in the literature on plant-based diet change. Research framed to focus on issues of capability and opportunity was found lacking.

The overemphasis of psychological processes and underemphasis of contextual factors is a tangible example of an imbalance within the research of barriers and enablers. Results such as those by Graça et al. (2019a) show that a conscious focus on making the analysis inclusive to a variety of factors could lead to more balanced results. A similar conclusion can be derived from a larger sample of barrier and enabler literature as many authors whose works are discussed in the following sub-chapters highlight how important it is to examine contextual barriers in addition to psychological ones. From the frequency of these statements, one can conclude that previous research has focused perhaps too strongly on barriers “within” the individual. The development toward elaborating also on the barriers and enablers “outside” of the individual seems to correspond to the wider discourse on the conceptualizations of locked-in lifestyles and behavioural change that nowadays recognizes the importance of external factors and does not regard individuals as purely guided by their internal intentions (Barr, 2015; Jackson & Smith, 2018).

2.3.2 Examples of barriers

Literature on barriers that obstruct individuals or households from adopting sustainable or low-carbon practices is ample. Given the scope of the literature this review offers only a small taste of it. In some papers, barriers are discussed in relation to specific practices. For example, barriers related to low-carbon food choices have been examined by Ensaff et al. (2015). In other cases, barriers are linked to a wider notion rather than a single group of distinct practices, for example, to engagement with climate change (Lorenzoni et al., 2007), climate change mitigation and adaptation (Gifford, 2011), climate change action (González-Hernández et al., 2019a), sustainable lifestyles (Axon, 2017), and greener modes of consumption (Druckman, Hartfree, Hirsch, & Perren, 2011). As touched upon previously, perhaps the most often used way to distinguish between various barriers is their division to psychological or internal barriers, and to social, physical, or external barriers.

Gifford (2011) offers a comprehensive review of psychological barriers to acting upon climate change. His review is based on a wide range of literature on the psychology of behaviour change on the basis of which he distinguishes seven categories of barriers that manifest themselves in 29 specific ways called “dragons of inaction” (Gifford, 2011, p. 290). The seven main categories include limited cognition, ideologies, comparisons with others, sunk costs, discredence, perceived risks, and limited behaviour. Similar themes recur in the listing of individual barriers by Lorenzoni et al. (2007) such as lack of knowledge, uncertainty, the belief in the saving grace of technological innovation, and relegating all of the responsibility to other actors. In Ensaff et al. (2015) the barrier of lack of knowledge exhibited itself as confusion around the health implications of plant-based diets.

Additionally, González-Hernández et al. (2019) classify some barriers as deriving from an internal source, for example, inconvenience of changing old habits and obligations related to familial and work life, and lack of perceived locus of control and self-efficacy. The latter represents a combination of two beliefs: that one does not have the skills to influence the situation and that one’s actions cannot better the situation in the first place. Internal barriers can then be viewed through a mainly psychological lens such as in the

case of Gifford (2011) or by understanding them as parts of an individual's life that they have relatively more power over (González-Hernández et al., 2019).

In terms of external barriers, it is widely recognized that structural and cultural changes are needed to realize the needed behaviour changes towards true sustainability (for example, Newton & Meyer, 2013). Several factors that physically and socially structure our lives act as barriers to pro-climate action. In Lorenzoni et al. (2007) and González-Hernández et al. (2019) participants noted how insufficient infrastructure inhibited their ability to change their behaviour for example through poor public transport services, inadequate recycling systems, and the focus on car use in the current built environment.

Lack of action in political and corporate arenas has also been recognized as a significant barrier as inaction on higher levels of decision-making reflects itself to the lives of individual people (Lorenzoni et al. 2007; Axon, 2017). Lack of involvement on lower levels of power such as on the community level was also recognized as a barrier (González-Hernández et al., 2019). Social norms and expectations i.e. what types of lifestyles are perceived as "normal" and acceptable in the dominant culture can also act as a barrier to sustainable behaviour change (Lorenzoni et al., 2007; Druckman et al., 2011). For example, in their study of how different consumption orientations affect the transition toward plant-based diets Graça, Truninger, Junqueira and Schmidt (2019) found out that when the importance of social image is held to a high regard, transition to new diets seems less desirable.

2.3.3 Examples of enablers

Enablers act as a counterforce to barriers and can help people overcome the difficulties mentioned in the previous chapter. In many cases the relationship between barriers and enablers can be characterized as one where the lack of something, be it knowledge, money, or adequate infrastructure, is being replaced by its presence (Axon, 2017).

Through analysing focus group discussions, Axon (2017) uncovered barriers and enablers related to sustainable lifestyles side by side. According to him different enablers (and barriers) are most significant at different time points during one's lifestyle transition. In the short term it was found out that in addition to providing tailored information and raising awareness of the benefits of sustainable living, making the process emotionally evoking could support the transition. A study by Coisnon, Rousselière and Rousselière

(2019) on sustainable gardening practices also indicated the importance of access to information related to the environmental benefits of the practices. Also, monetary and participatory incentives were deemed as important enablers at the starting stages of lifestyle change by Axon (2017).

Continuing with Axon (2017), giving people positive and personalized feedback on the practices they had already adopted was deemed important in maintaining engagement in the medium-term. Lastly in the long-term time horizon, collective community action in its many forms such as projects and events appeared as an integral enabler. Also, Coisnon et al. (2019) highlighted the importance of strengthening social capital for example in the form of endorsing relevant national and local organizations. In addition to a favourable social environment also an enabling physical environment was regarded as essential for instance in the form of decentralized energy systems (Axon, 2017). With just these examples a trend of internal and external dimensions can be seen, as was the case with barriers. Provoking positive emotions and providing tailored information focus on the psychology of an individual while emphasis on community action and developing new types of infrastructure are connected to the prevailing social norms and physical structures.

When approaching the elements that drive individuals to move toward more sustainable lifestyles one cannot bypass motivations connected to a deeper affective level. Engaging in an environmentally sustainable and low-carbon lifestyle does not need to be based on a strong value of environmentalism and can instead be grounded on other values and motivations such as the consideration of health, pursuing ideals of frugality, and fighting for animal rights and social justice (Evans & Abrahamse, 2009). For example, in terms of plant-based diets Graça et al. (2019b) observed that orientations linked to self-producing, ethical considerations, health, and naturalness are driving diet transitions forward. Moral considerations of compassion, fairness and purity have been recognized as potential driving forces of intentions to partake in climate change mitigation (Dickinson, McLeod, Bloomfield, & Allred, 2016).

From a holistic perspective Brown and Vergragt (2016) state that the transition away from our current materialist society needs to arise from new conceptions of what “good life” is. If these new conceptions were less dependent on consumption activities as they are now, pursuing a good life could act as fuel for sustainability and low-carbon transitions.

One avenue for this could be spirituality. Even today to many people the ideal of living a good life is linked with notions of spirituality. Integrating sustainability with spirituality could enable some people to engage with it on a deeper level (Krempl, 2014).

Considering all the perspectives on barriers and enablers mentioned in this brief review, it is easy to conclude that reaching low-carbon and sustainable behaviour change is complicated. To make matters even more complicated, not all barriers and enablers have equal importance in all contexts. Taking note of this thought we will now turn to examine rural areas as a context of low-carbon living.

2.4 Rural areas of Finland

The aim of this thesis is to examine which factors obstruct or enable rural citizens of Finland to adopt low-carbon practices. But why pay attention to place of residence? Concentrating the analysis on a specific type of area is sensible because considering what may have an effect on low-carbon lifestyle change in certain local contexts enables finding out what interventions could be favourable in those localities (Axon, 2017). On one hand, when the purpose is to alleviate barriers identifying which barriers are prevalent in a particular dwelling context can help target the most relevant barriers better. On the other hand, determining which enablers have distinct forms or importance in a given area can help create a local environment that facilitates change to a higher degree.

There is no one universal “rural area” in Finland but instead a plurality of different types of rural areas. Circa 95 % of the total area of Finland is classified as rural (Helminen et al., 2020). The currently used area classification system enables the inclusion of many different area types within a given municipality. In it, areas are allocated into seven classes of which four describe rural areas: local centres in rural areas, rural areas close to urban areas, rural heartland areas, and sparsely populated rural areas. Each of these area types has its own characteristics when it comes to for example population density, the number of jobs, and land use (Helminen et al., 2020). Studies looking at different types of areas can also create their own classification systems as is the case in Siirilä et al. (2013) who divide rural areas into areas of strong villages, rural areas of small municipalities, and peripheries of long distances. Even though in this thesis I study individuals only from one municipality, it is important to recognize that rural areas are

not uniform and how making generalizations based on findings from one area must therefore be done very mindfully.

Still, certain common characteristics are often associated with the concept of rural areas some of which can have implications for the low-carbon possibilities of these areas. First off, long distances tend to describe the mobility sphere of rural areas. In terms of housing detached houses are especially common in rural areas (Heinonen & Junnila, 2011). Also, Siirilä et al. (2013) found out that homes in rural areas were relatively large and wood-based fuel was utilized as the sole heating medium in circa one fourth of the houses of rural participants. Siirilä et al. (2013) also observed that when it came to food practices gathering, growing, and hunting contributed to a bigger proportion of the food consumption of rural citizens when compared to citizens living in more urban areas. They interpreted this to be the result of both the proximity of nature and how practices such as picking berries may be more conventional in rural areas. Proximity to nature and the concurrently closer proximity to natural resource extractive enterprises such as agriculture can also lead to a more utilitarian view of nature in rural areas: still, not all rural citizens have social links to these enterprises and there is no one uniform rural perspective on the natural world (Sharp & Adua, 2009). In terms of the cultural and social climate, it is generally considered that rural areas are more politically conservative or narrow-minded places than their urban counterparts (Malmsten, 2004). On a more positive note, a strong sense of communal spirit is often linked to an ideal view of rural areas (Malmsten, 2004).

In the context of affluent Western countries such as Finland literature on the intersection of climate change, the lifestyles of individuals, and place of residence concentrates often on contrasting rural and urban populations with one another. This is done for example by comparing the lifestyle carbon loads of people living in differing residential areas (Gill & Moeller, 2018; Heinonen & Junnila, 2011; Poom & Ahas, 2016). The results of these comparisons have been mixed and the aforementioned studies have showed no radical differences in per capita environmental loads between rural and urban populations, although some differences are present.

One could initially assume urban living to be the most sustainable way of life and this assumption holds true in many regards. Compared to rural areas cities are densely built which contributes to saved energy especially in the housing and transport sectors. For

instance, in Germany the density effect is visible in how per capita direct emissions from domestic energy and private transport decrease when the municipality size grows (Gill & Moeller, 2018). Also, in Finland private driving causes more emissions the smaller the population density of an area is (Heinonen & Junnila, 2011) given the previously mentioned longer distances of rural areas. There are however factors that counter the density effects enjoyed by cities including smaller household sizes, higher levels of income, and consumption opportunities that are more easily available when compared to rural areas (Gill & Moeller, 2018). Heinonen and Junnila (2011) observe the level of income to be especially influential in this regard as income levels are on average higher in cities. Still as Heinonen and Junnila (2011) highlight, in the case of income the importance of residential area should not be exaggerated as increasing incomes indicate rising carbon emissions regardless of place of residence.

Given that on per capita emissions basis Finnish rural areas do not seem to lag behind urban areas, rural areas should not be viewed through a more negative lens when discussing low-carbon lifestyles. Siirilä et al. (2013) call for a renewed place-based research focus that does not concentrate only on comparing areas in an effort to pit them against one another but instead centres analysis on overcoming difficulties that are unique to various areas. The importance of balance could be stipulated here as well: to provide a holistic picture of the situation in a given area, attention has to be paid to both difficulties and opportunities faced by the area.

Siirilä et al. (2013) have produced an informative work on the effects of residential area on opportunities of environmentally-friendly living in Finland. The following example that they have provided describes these effects and their variability well. In their study people living in rural areas identified that long distances and lack of sufficient public transport acted as hindrances to the reduction of private driving. In urban areas, even though public transport was more available, other factors such as bus schedules not fitting into one’s personal schedule made private driving a more desirable and convenient practice. In this example the act of private driving is induced by slightly different underlying circumstances depending on the place of residence. Overall Siirilä et al. (2013) conclude that place of residence does affect which sustainable practices people can adopt and in which ways. Also, Ovaskainen (2019) discusses in-depth in her doctoral dissertation the implications of rural residence on the opportunities for ecological

lifestyles in the region of Lapland. Along with Siirilä et al. (2013) she highlights the situatedness of lifestyles that stems from the physical and social realities characterizing a particular area.

Place of residence could then perhaps be best understood as an underlying soil on which various barriers and enablers grow. Some of them can be universal while others are more unique to the place. Place of residence does not necessarily make the lifestyles of people living in one place more unsustainable or high-carbon than others. Still, at the very least it affects the ways in which low-carbon practices are or have to be undertaken. Continuing forward, we return to the research design of this study after which the research methods are recounted.

3 Research design

This study aims to report an overview of different barriers and enablers that people living in rural areas perceive to be affecting their ability to shift their everyday practices into ones with lower carbon intensities. Considering barriers and enablers that influence the absorption of low-carbon practices is important as lifestyle change does not tend to happen in a vacuum of free choice (Jackson & Smith, 2018). By knowing what factors influence the process of adopting new practices it is possible to focus efforts on alleviating barriers to and enhancing enablers of lifestyle-based climate change mitigation. As barriers and enablers can differ between different contexts (Siirilä et al., 2013) it is important to consider how living in a certain type of area affects their manifestation. In this thesis I have decided to focus on Finnish rural areas as a specific context of living. Given that the relationship of rural areas, the carbon load of everyday practices on those areas, and climate change mitigation has been and remains a provocative one (for example Heinonen & Junnila, 2011) the focus is justifiable. The municipality of Kauhajoki portrays an example of a rural area in this thesis.

As a result of the aforementioned, the research questions are as follows:

1) What barriers do people living in Kauhajoki face when trying to implement low-carbon practices into their lifestyles?
2) What enables people living in Kauhajoki to implement low-carbon practices into their lifestyles?

The research data for this study consists of interview transcriptions. In order to uncover barriers and enablers that people living in the municipality of Kauhajoki face, eight semi-structured interviews were conducted. The participants were required to have positive environmental attitudes as an effort to highlight the existence of a possible value-action gap (Newton & Meyer, 2013). In the interviews the participants were asked to discuss a collection of different low-carbon practices. The low-carbon practices used in the interviews were compiled from the Finnish Innovation Fund Sitra's 100 smart ways to live sustainably-website (Sitra, n.d.-a).

For the analysis of the interview data qualitative content analysis was utilized. Content analysis as a family of methods aims at producing conclusions from data such as texts by going through them in a systematic manner (Drisko & Maschi, 2015). The version of qualitative content analysis I applied on my data resembles "conventional content analysis" as distinguished by Hsieh and Shannon (2005) in which the coding is done inductively without a pre-existing code list. Utilizing content analysis as a method of analysis fitted this study well as I wanted to abstract my data from individual statements made by the participants into distinct categories of barriers and enablers.

The results of my study will not be fitted into a particular model such as in the review by Graça et al. (2019a) on plant-based eating. I will follow on the footsteps of for example Lorenzoni et al. (2007) and González-Hernández et al. (2019) who have depicted their results by categorizing their results in an inductive way instead of utilizing any specific framework. As my purpose was to describe the variety of barriers and enablers perceived by rural residents, the research design of this study resembles most closely a descriptive design in which the aim is to describe or to depict some aspect of a sample, in this case the perceptions of rural residents on what obstructs or enables them to adopt low-carbon practices (Drisko & Maschi, 2015).

4 Materials and methods

In this chapter I will present the practical execution of the study. I will recount how the research data was collected through conducting semi-structured interviews and how the interview data was analysed by utilizing a qualitative content analysis approach. Before

going into the methods, I will briefly introduce the research location, the municipality of Kauhajoki.

4.1 Research location

The municipality of Kauhajoki was chosen as the research location. The municipality represents a relatively smallish Finnish town that is situated in a mostly rural area of Finland which is why it was an appropriate choice considering the research question. Kauhajoki is located in the South Ostrobothnia region which lies in Western Finland. The population of the municipality was 13 184 residents in 2019 (Statistics Finland, n.d.). According to the Association of Finnish Local and Regional Authorities (2019) the average population size of Finnish municipalities was 17 766 people and the median size 6 066 people in the year 2019 meaning that in terms of size Kauhajoki situates between these two figures and is fairly average sized. It can still be rightly argued that Kauhajoki is quite large compared to the smallest Finnish municipalities and does not provide a snapshot of the *most* rural area of Finland. Generalizing the results of this study to rural Finland at large must then be done cautiously and with respect to the special characteristics of each location.

The biggest municipality of South Ostrobothnia, Seinäjoki, is located about 60 km northeast of Kauhajoki. Circa 35 per cent of the working population of Kauhajoki worked in primary and secondary production in 2018 while the corresponding number for the whole of Finland was circa 24 per cent (Statistics Finland, n.d.). From a political perspective the city council represents a common rural type of municipality in Finland where the Centre Party has the most representatives (14 out of 35, 39 % of the votes) (Yle, 2017).

Kauhajoki was chosen as a research location also because I have lived there for most of my life. Having pre-existing experience of an issue, in this case having lived in the research area, demands one to be conscious about possible biases in the analysis (Erlingsson & Brysiewicz, 2017). Still, I think that my own experience of Kauhajoki provided benefits for the conduct of this study. Firstly, I believe that through being able to situate myself in Kauhajoki I appeared more familiar to the interviewees as they knew that I was “an insider” and had a sense of the area. In other words, they could make remarks of Kauhajoki conditions without needing to explain all the contextual

characteristics of Kauhajoki. Secondly, the familiarity with the location of the study provided aid in the interpretation of the results as I had some previous inclinations as to how things might look like in the area and as I understood from my own experience what types of characteristics rural areas may have in terms of low-carbon living.

4.2 Data collection: semi-structured interviews

Semi-structured interviews were conducted to collect the data for this study. As I wanted to examine personal insights and perceptions about low-carbon practices, interviews served the purpose most effectively. In general, interviewing is one if not the most used method for qualitative data collection (Figgou & Pavlopoulos, 2015). Semi-structured interviews differ from strictly structured ones in that the structure of the interview and the way in which the questions are formulated are not immutable (Ruusuvuori & Tiittula, 2005). This allows for flexibility in the interview situation, as there is an opportunity to accommodate for follow-up questions and adjust the structure based on experience from previous interviews. Semi-structured interviews are however more heavily shaped by the researcher when compared to completely unstructured ones that try to emulate a freely flowing discussion (Figgou & Pavlopoulos, 2015). As Wengraf (2001) emphasizes, the flexibility of semi-structured interviews does not equate to less preparation. Compared to fully structured ones they might even require more preparatory work as the component of uncertainty stemming from the researcher's need to improvise in the moment must be mentally addressed during the preparation (Wengraf, 2001). Next, the sampling procedure is presented after which I return to the structure of the interviews.

4.2.1 Choosing the research participants

I decided to interview residents of Kauhajoki who held a positive environmental attitude, were already interested in environmental issues, or considered them in their everyday life. By doing this I wanted to highlight the possible existence of a value-action gap (Kollmuss & Agyeman, 2002) and show that people with positive dispositions toward low-carbon actions can also face barriers when trying to adopt them. On the other hand, I wanted to interview people who might see beyond the barriers and bring forth enablers that have helped them adopt certain practices. On a practical note, I valued that the participants

were attuned to the subject beforehand which I reckoned could lead to a richer and more nuanced conversation.

The research participants were acquired through various means. Two of the interviewees were contacted by email and the rest contacted me after I posted a call for participants on two local Facebook groups and my own Facebook feed. The two local Facebook groups belonged to Suupohja region's environmental society and Suupohja region's ornithological society which I reckoned would be suitable sources for people interested in environmental matters. I was acquainted with some of the participants beforehand and some I had not met before the interviews.

The sampling procedure of this study resembles most closely purposive or judgment sampling as the calls for participants explicitly mentioned the characteristics (interest in environmental issues) that the interviewees were expected to have but I could not control who decided to answer the call (Gray, Williamson, Karp, & Dalphin, 2007). There was both an element of purposeful selection and an element of randomness in the actual sampling.

4.2.2 Interview structure

At the start of the interview, participants were asked to introduce themselves and describe their attitude towards environmental issues. After this they were asked to briefly explain what the concept of climate-friendly lifestyles meant to them. However, this question was not asked from all interviewees.

The bulk of the interview consisted of going through three lists of low-carbon or climate-friendly practices related to housing, mobility, and diet. The low-carbon practices were derived from the Finnish Innovation Fund Sitra's 100 smart ways to live sustainably-website (Sitra, n.d.-a). Practices tagged with *living*, *transport* or *food* were chosen from the website, along with a few practices tagged with *tourism*. Based on these tags, I separated the practices within three categories of Housing, Mobility and travel, and Diet. Within these higher-tier categories I divided the practices into sub-categories in order to make the lists more easily readable. Sub-categories included for example Electricity, Recycling, Car's energy source, Minimizing travelling distances, More or purely veggie-based food, and Preventing food waste. The three lists can be found in Appendix 1. For

the interviews, the lists were printed on three sheets of paper, each of the three top-categories on their own sheet.

The decision to use practices from Sitra's 100 smart ways to live sustainably-website (Sitra, n.d.-a) was based on the prominence of Sitra as an actor in the sustainability field of Finland, and the fact that the Sitra Lifestyle Test, a carbon footprint calculator, had been done over 900 000 times at the time of the interviews, a considerable number compared to the total population of Finland (Sitra, n.d.-b). Given the broad nature of the actions mentioned in the 100 smart ways-website I felt confident in using them as proxies of climate-friendly/low-carbon practices.

During the interview, the participants were given the three lists of low-carbon practices. They were asked to go through the practices and discuss freely which they saw as fitting to carry out in the context of Kauhajoki and which perhaps not so much. They were also asked to ponder the reasons behind the adoptability of different practices. Participants were encouraged to reflect on the practices by using their own lifestyles as a point of reference, a framing which made the subject more easily accessible. My role in this part was to make some additional questions to clarify unclear points but I mainly let the participants' thoughts run freely. The participants were also asked to reflect whether there were any practices that they thought were missing from the lists (additional climate-friendly practices).

After going through the lists, the participants were asked one or several of the following questions: What do you think of the individual-focused perspective in climate change mitigation that these practices represent? How do you see the role of rural areas or rural people in current climate discourse? Are they represented accurately? Do you have anything to add concerning sustainable or climate-friendly lifestyles and rural areas? The aim of these questions was to provide some contextual insights to the issue of rural areas and climate change/sustainability.

4.2.3 Conducting the interviews

A total of eight interviews were conducted. The size of the interviewee sample was based on my supervisors' suggestion. In general, it should be acknowledged that there is no one standard desirable sample size when using qualitative content analysis (Bengtsson, 2016). The interviewee sample consisted of four women and four men. The age of the

participants ranged from 34 to 65 years. In terms of occupation the sample included a student, fully or partially retired people, and people working in the public and private sector.

The interviews were conducted in Finnish on a one-on-one basis in Kauhajoki during a two-month period from 27th of January to 16th of March. I visited some participants in their homes and some I met in public places or their workspaces. Before the interviews, the participants were asked to sign a consent form of which they were able to receive a duplicate. The interviews were varied in length ranging from 35 minutes to 1 hour and 15 minutes. For the most part they followed the previously described format. In some cases, certain questions from the last section of the interview were omitted for example because of schedules. There was also variation in the wording of the questions.

The interviews were recorded with a digital recording software and additional notes were taken on paper. Recording was a relevant practice as it ensures that the voices of the participants are represented accurately in the final analysis by making word-by-word analysis possible (Ruusuvuori & Tiittula, 2005). The recordings were transcribed, and my data consists of these transcriptions. The notes taken by hand during the interviews were in the end not used in the analysis phase. The transcriptions constituted purely the words of the participants and for example non-verbal gestures, tone and intonations were mostly omitted from them. Limiting the transcriptions this way was based on how they were to be analysed. As I did not focus on *how* the participants said something but only on *what* they said, the level of transcriptions can be deemed sufficient (Ruusuvuori & Tiittula, 2005).

4.3 Analyzing the data with content analysis

For my data analysis, I used the method of content analysis. Content analysis can be described more as a family of different analysis techniques than as one uniform method (Drisko & Maschi, 2015) which is why barely stating the use of content analysis without specifying the analysis process in a more detailed manner is not enough. Applying content analysis to one's own data and understanding the *how* of the analysis process can be difficult for someone who is just getting acquainted with the method (Erlingsson & Brysiewicz, 2017). Because of this I will briefly present some of the different approaches to doing content analysis and basic concepts applying to the method. After this short

general part, I will recount what type of content analysis I used in my study and how the process of analysis played out in practice.

4.3.1 What is content analysis?

Drisko and Maschi (2015, p.6) present the following definition of content analysis: "a family of research techniques for making systematic, credible, or valid and replicable inferences from texts and other forms of communication". These techniques can be both quantitative and qualitative in nature although the distinctions between different types of content analyses are flexible (Drisko & Maschi, 2015). Also, content analysis approaches that stem from one tradition can also have a multitude of versions that have their own practical intricacies (in the case of qualitative content analysis, Hsieh & Shannon, 2005). Therefore, communicating the technique of one's own analysis and being systematic in it is of utmost importance to ensure the rigor of the study.

In quantitative content analysis the use of quantitative statistical methods is characteristic. Quantitative type of analysis is usually done on existing data i.e. new empirical data is not gathered for the purposes of the analysis (Drisko & Maschi, 2015). In qualitative content analysis statistical methods are not used and the analysis is most often done on data that is freshly collected. Quantitative content analysis is most often used to examine manifest content while in qualitative approaches also latent content can be considered (Drisko & Maschi, 2015). Manifest content means the surface level of the text, what is said, while latent content refers to the hidden meaning which lies underneath what is explicitly said (Gray et al., 2007). In simple terms one can say that the more qualitative the content analysis is the more space it gives for interpretation although as Graneheim and Lundman (2004, p. 106) state "there is always some degree of interpretation when approaching a text".

A commentary paper by Erlingsson and Brysiewicz (2017) provides a simple hierarchy of the main concepts related to the analysis process. These terms, in an order from the lowest level of abstraction to the higher ones, include meaning unit, condensed meaning unit, code, category and theme. A paper by Graneheim and Lundman's (2004) provides discussion on these concepts. According to them meaning unit can be understood as "words, sentences or paragraphs" that by themselves embody some (individual) thought (Graneheim & Lundman, 2004, p. 106). Condensing a meaning unit means the act of

Abridging the unit without losing its main point. Codes can be described as labels that are given to the meaning units. What is perhaps most important to distinguish in the coding process is whether the codes have been mostly derived from existing theory and literature (deductive coding) or whether they have been derived from the data itself (inductive coding) (Drisko & Maschi, 2015). These two forms of coding can also be utilized together.

On the higher levels of abstraction lie sub-categories, categories, and themes. Categories should be developed by following the principles of exhaustiveness and mutual exclusivity i.e. every meaning unit, and the code assigned to it, that is relevant to the research question should be attempted to be put into at least one category that has distinct characteristics that distinguish it from other categories (Gray et al., 2007). According to Erlingsson and Brysiewicz (2017) the tendency to make the categories too inclusive can affect these principles negatively and they suggest the use of sub-categories as a way to ensure the later distinctiveness of categories. According to Graneheim and Lundman (2004) the concepts of category and theme differ on the basis of the questions they aim to answer: categories often embody more descriptive names and attributes answering the question of *what* while creating themes relies on a more interpretive perspective and answering the question of *how*. However, this distinction is not uniformly used in content analysis literature (Drisko & Maschi, 2015).

4.3.2 How I applied qualitative content analysis

My implementation of content analysis most closely follows "conventional content analysis", one of the types of qualitative content analysis that Hsieh and Shannon (2005) distinguish. According to them, conventional content analysis is usually used in descriptive studies, its coding is based on the text itself i.e. coding is inductive and the arrangement of codes into sub-categories and categories is based on the interlinkages between the codes. As my data was gathered by me and the possibility to use statistical methods was not considered in the gathering process, the use of a qualitative technique was the most natural choice (Drisko & Maschi, 2015).

It can be argued that given the already researched nature of the subject of this study a deductive approach could have been used in the generation of the codes. Still, I coded the data inductively. Through inductive coding I wanted to ensure that I did not miss barriers

or enablers that were not necessarily mentioned in earlier literature. Still, given that I had familiarised myself with the literature before the analysis the underlying knowledge of barriers and enablers has most certainly given me inspiration in the coding process. Also, a deductive coding scheme would not have prevented me from adding new codes to the code list when needed (Drisko & Maschi, 2015). The choice to practice inductive coding can therefore be rightly questioned.

Next, I will go through my analysis process. I started the analysis of each interview by reading a printed version of the transcription and simultaneously marking on the paper sections that I thought were relevant to my research questions regarding barriers and enablers. Then I reread the interviews on the computer and marked out the previously marked out sections and, when needed, some new sections that I found relevant. These sections, most often a part of a sentence or one to two sentences, were my meaning units. I mainly focused on manifest content but tried to also look at latent content. For coding purposes, I made a spreadsheet with each interview on their own page and copy-pasted each meaning unit to the sheet. After condensing the meaning units of a few interviews, I realized that condensing them brought no added value to my process and consequently omitted that step.

I coded the meaning units in the spreadsheet. The coding was based on my research questions which meant that every code represented a factor that could be described either as a barrier to or an enabler of adopting low-carbon practices. For example, codes “practical limitations of vehicles” and “obligations at work” were barrier codes and codes “products available” and “easiness” enabler codes. Some barrier and enabler codes had the same names, for example “life situation” or “close relationships”. Codes that were created during coding the first few interviews were applied to the later interviews when possible, and when not, new codes were added to the “codebook”. I did the coding process twice although the first round of coding could be called a preliminary round were the main purpose was to familiarize myself with the data.

After coding all the interviews for a second time I began the categorization process. First, the meaning units linked to each code were copied to a separate document. This allowed me to easily see how many mentions each code (aka barrier or enabler) had received in the interviews. I created separate categories from barrier-codes and enabler-codes as an effort to stick to the dual framing of the research question. Categorizing was done on an

intuitive basis. In practice this meant that I went through the code-lists multiple times and grouped together codes that seemed to be related to one another. For example, barrier-codes and enabler-codes that had some connection to money were situated under the categories of *Financial viability and sensibility* (barriers), and *Financial sensibility and frugality* (enablers). Some codes, such as the "lack of time"-barrier contribute the whole of one category, in this case *Limited time*. Even though statistical methods are not used in qualitative content analysis, simple counting can be used (Bengtsson, 2016). I decided to count the meaning units of each category and included the number of meaning units (or mentions) into Tables 1 and 2 in the Results-section.

The categorizing process is not easy to explain in detail here as it had a strong intuitive component. To provide some illustration of the process of information abstraction a figure with a few examples of the analysis process from meaning units to categories is presented in Appendix 2, as suggested for example by Bengtsson (2016), and Erlingsson and Brysiewicz (2017). Given that I conducted the interviews in Finnish I had to translate all quotes that appear in this report. For clarity purposes some filler words are omitted from the translations and small adjustments have been made to the structure of the sentences without obscuring the original meaning of the quote.

In hindsight I recognize that some of the categories that I arrived at could have been separated into two (for example, the category of Infrastructure and technology). Also, the principles of exhaustiveness and mutual exclusivity were not fulfilled in all cases as some codes might be fitted to other categories as well and the categories can be seen overlapping in some places (for example, categories linked to Perceptions and Feelings).

4.4 Ethical considerations linked to the methods

To ensure that the interviewees consented to participate in the study they were asked to fill out a consent form. In it they were promised that they had the opportunity to withdraw their participation at any time before the thesis was returned for inspection. A duplicate of the consent form was offered to the participants. In terms of keeping the data safe the interview recordings and transcriptions were kept only on my personal devices and secure

cloud storage account. The interview data will be deleted after the thesis has been accepted.

Assuring the confidentiality of the participants in the finished thesis is an essential concern in all research endeavours, and especially important in this thesis given the relatively small population of Kauhajoki municipality (Gray et al., 2007). To avoid or at least limit the possibility of someone recognizing a participant I decided not to describe my sample in detail but to only give a description of the age range of the participants and a rough list of their occupations. Also, personal information (name and address in the cases when I visited the participants in their homes) was omitted from the interview transcriptions.

It is important to portray the voices of your participants as accurately as possible. As research always includes a degree of interpretation it is inevitable that the voice of the researcher permeates through the way these other voices are represented. One means through which I have tried to ensure that the participants original views are visible in the most authentic way is by including a selection of direct quotes in the thesis (Drisko & Maschi, 2015).

5 Results

The results of the study will be presented in the following manner. First, an overview of the categorization of all barriers and enablers that emerged during the interviews will be presented. After this the categories will be introduced in more detail. During this more detailed introduction special attention will be paid to the barriers and enablers within a given category that are specifically linked to the participants' rural place of residence.

5.1 An overview of barriers and enablers

An overview of the barriers to and enablers of adopting low-carbon practices that were discovered through analysing the interview data are presented in the following tables. Barriers are divided into fourteen categories (Table 1): *Availability of services and products; Infrastructure and technology; Outside conditions; Attractiveness of rural space; Other people; Financial viability and sensibility; Knowledge; Limited time; Locked-in habits and thoughts; Life situation and experiences; Perceptions of difficulty and distance; Feelings and preferences; Conflicting issues; Health and well-being.*

Enablers are divided into thirteen categories (Table 2): *Availability of services and products; Infrastructure and technology; Rural space; Political measures; Other people; Financial sensibility and frugality; Knowledge; Time; Forming habits; Life situation and experiences; Perceptions of easiness and sensibility; Feelings, values, and preferences; Health and well-being.* Most barrier and enabler categories overlap in terms of their naming and the types of issues that are linked to them.

The barriers that constitute each category are described in the table. Same is true for the enablers. In addition, the tables include the number of mentions per each category (n) ergo the number of meaning units whose codes belong to that category. However, these numbers must not be taken purely at face value as some individual statements could have been categorized differently. It is therefore advisable to perceive the numerical results as directional, not absolute.

Furthermore, the tables contain one quote derived from the interview data per each category. These quotes were chosen to illustrate the content of the categories. However, it cannot be claimed that they completely encapsulate everything that is included in each category. In an attempt to rectify this, I have included a broader selection of quotes from each category to be presented in Appendix 3. Also, additional quotes appear in the following part of the Results-section.

Table 1 Barriers to adopting low-carbon practices

CATEGORY	N	BARRIERS INCLUDED IN THE CATEGORY	EXAMPLE QUOTE
Availability of services and products	38	services enabling low-carbon practices not available; services centralizing; deficiencies in public transport; combining modes of transport is difficult; low-carbon products unavailable, not well-displayed or of bad quality	*"…we checked out whether it would have been possible to commute by public transport, and it was possible to get to work in the morning [to a neighbouring town] but there was no way to come back home." (P7)*
Infrastructure and technology	33	insufficient infrastructure; shortcomings in waste management; existing building structures; unfunctional technology; practical limitations of vehicles; long distances	*"…overall, these circumstances, infrastructure, should be developed to favour cycling and walking more, because now people have been just fully driving cars for the past 40, 50 years and it is all about how to get to places by car most directly and easily." (P3)*
Outside conditions	10	weather conditions; slipperiness of roads because of the weather	*"…my commute is 2 km so I will not cycle in the winter, but I hope that I could motivate myself when the ice has melted, and it will not rain." (P7)*
Attractiveness of rural space	3	heterogenous rural areas; rural areas unattractive as holiday destinations	*"…but admittedly there are not many tourists here, this place is not the "Mecca" of tourism." (P6)*
Other people	23	close relationships and maintaining them; acquaintances; hard to trust strangers; attitudes of others and social norms	*Well, I have sometimes received feedback on the matter. I used to practice plant-based foods, but not currently." (P6)*
Financial viability and sensibility	29	low carbon practices unprofitable, expensive, not cost-effective, and not financially sensible; limited wealth; cheap square meters	*"I am at the moment unemployed and retired so money is a bit tight, so I am currently no longer able to make those kinds of large investments." (P5)*
Knowledge	20	lack of knowledge, familiarity, or experience regarding low-carbon practices or local opportunities of their implementation; poorly available information	*"I do not know about plant, oat milk, what would it then contain, whether I would get the same things from it, I have not researched it yet." (P3)*

Limited time	13	low-carbon practices taking more time; other priorities taking time; the limited nature of time; hurry	*"Travelling [internationally] by train is tempting but there is the question of time." (P1)*
Locked-in habits and thoughts	29	habitual behaviour, and easy and familiar ways of acting; easy to remain stuck; attained comforts; forgetting to maintain new habits; old mindsets; ideas have not come to mind or seem unfitting to the current situation	*"…that is also apparently a somewhat dated habit, that people use block heaters in relatively new cars, although even mechanics have said that new ones do not need it because the motors have developed." (P4)*
Life situation and experiences	38	living alone or with other people; age; having children; living in a row house; obligations at work; hobbies; personal background; previous negative experiences	*"…we have talked about adjusting the temperatures inside the apartments and then there are residents who don't want the same temperature as somebody else…" (P2)*
Perceptions of difficulty and distance	32	low-carbon practices seem difficult or require effort; insurmountable need; environmental issues seem distant; own actions perceived as insignificant	*"…we have felt that composting would perhaps be a bit challenging, would we be able to get it going, so we have not done it." (P8)*
Feelings and preferences	18	avoiding negative emotions; not interested or convinced; need for privacy; a sense experience	*"Veggie foods do not go over that well in our family." (P8)*
Conflicting issues	13	low-carbon not the priority; conflicting values; other instructions; harmful side effects; unreasonable actions	*"…laundering is challenging when you want to stick with full loads. When you know that some have to be washed in 30 degrees, some in 40 and 60, and you do not want to mix the reds and the whites, so if you follow them closely it would be terrible." (P2)*
Health and well-being	9	worry about health; physical fitness	*"…all types of beans and such are not suitable for me personally, so it is a bit difficult physically." (P4)*

Table 2 Enablers of adopting low-carbon practices

CATEGORY	N	ENABLERS INCLUDED IN THE CATEGORY	EXAMPLE QUOTE
Availability of services and products	27	services enabling low-carbon practices available; low-carbon products available and well-displayed; possibility for local production of biogas; functional public transport	*"Yes, you can find them [organic and local food] pretty well and it is nice that they, especially organic products, are displayed like ta-da, here they are." (P2)*
Infrastructure and technology	17	adequate infrastructure; developing infrastructure; existing building structures; developing technology; social media; short distances	*"…are not there going to be some reforms when it comes to recycling in Kauhajoki? For one, plastic will be collected in condominiums with at least five apartments." (P3)*
Rural space	7	possible to produce food independently; open space; safety; rural areas as holiday destinations	*"A garden yes but nothing else than potato from our own land." (P5)*
Political measures	8	quotas; requirements; financial incentives; increasing taxation of carbon-intensive practices	*"…I would like to transfer to a heat pump, or it turns out that there could be some potential [financial] support coming for it…" (P6)*
Other people	21	close relationships and similar values; acquaintances; possibility of cultural norms changing	*"Well I am of course lucky in that way that my partner also comes from the environmental field, so he often takes care of these…" (P8)*
Financial sensibility and frugality	28	low-carbon practices profitable in the long-term, financially sensible, inexpensive, and not a question of money; limited wealth; general frugality supporting low-carbon practices	*"In my view reducing food waste is motivated by both the environment and frugality, in a sense that when one does not have money in abundance it is an easy way to save it." (P1)*
Knowledge	7	having knowledge about environmental issues; information being easily available	*"Now that there is practically daily news about climate change, carbon footprints, vegetarianism and so on, you really got to think about it often." (P2)*
Time	6	having time; low-carbon practices saving time	*"I don't have time to cook every day so it's good to have it prepared in advance. It also saves energy when*

			you do not cook on the stove every day and instead heat your portion in the microwave. – Yes, it saves time and energy." (P7)
Forming habits	13	already-formed, self-evident low-carbon habits; creating new habits when circumstances change; being flexible but sticking to decisions; being prepared; habits as steppingstones	*"Shorter showers first started when we had small structural issues, there are none at the moment, but that quite good habit has stuck from that time, at least I like it myself..." (P1)*
Life situation and experiences	14	having children; children moving out; having one's own yard; hobbies; personal background; learning from past mistakes	*"What has stuck with me from my home is that nothing [food] was thrown away, it was always just used to make hash." (P7)*
Perceptions of easiness and sensibility	21	easy, convenient, and sensible low-carbon practices; giving something up partially	*"...you get exercise [using an electric bike], but you do not have to sweat when you go to work..." (P4)*
Feelings, values, and preferences	33	low-carbon practices feel good; high-carbon practices feel unpleasant or bad; sense experience; personal preference and when needed, rejecting it; preferring cultural experiences; a positive stance; environmental and ethical values	*"Well in principle it is nothing, I just do not like the taste of meat." (P3)*
Health and well-being	9	healthy low-carbon practices	*"And when I think about it from the perspective of my health, a part of it is that I add veggies and eat more fish and so on, but the ideology behind it is more related to health than the environment." (P2)*

5.2 Barriers and enablers in a rural context

In this section a closer look at the different barriers and enablers is offered. In order to concentrate on the rural focal point of the research questions, barriers and enablers that have been interpreted as having specific connections to the rural dwelling context will be described in more detail. Given that most of the barrier categories have a corresponding enabler category with similar themes (for example *Financial viability and sensibility*, and *Financial sensibility and frugality*), these corresponding categories are addressed under a joint subheading (in the case of financial barriers and enablers under the heading of *Financial considerations*). This is done in an attempt to highlight how barriers and enablers are often linked to similar types of issues and can act as counterparts to one another. In cases were barrier or enabler categories do not have a corresponding enabler or barrier category they will be displayed in their own separate subchapter.

In each subchapter some general remarks on the substance of the categories are reported first. After this, if the category or categories in question include barriers or enablers that have links to the rural context in particular, those barriers and enablers are presented in more detail. In this more detailed examination, the barriers and enablers are not artificially separated from the low-carbon practices that they influence, and the specific low-carbon practices are integrated into the reporting style.

5.2.1 Availability of services and products

Issues concerning the availability of low-carbon services and products were identified both as barriers to and as enablers of adopting low-carbon practices. Availability concerns were mentioned relatively often. The availability of possibilities to carry out low-carbon practices can be conceived as the basic precondition of their realization. There were many barriers and enablers related to availability that were specifically linked to living in a rural area.

The most significant barrier to do with availability in the rural context that came up in nearly all of the interviews was the lack of local public transport opportunities. Local public transport refers here to bus transportation both inside Kauhajoki and between the closest towns stretching up to Seinäjoki. Problems with buses were related to the lack of

them, their poor timing, and insufficient routes. The following quote connects the poor availability of buses to another barrier: the centralization of services.

> *"…public transport has totally vanished from the countryside. Of course, it is understandable, village shops have vanished and public transport, so. But it is true that people do not use them, or it is not worth it.", P5*

In rural areas village-based services have been diminishing over the years and for example the number of village shops has more than halved during the last decade (Päivittäistavarakauppa ry, 2020). This trend significantly lengthens distances to services for people living in remote villages which in turn increases reliance on private driving given that bus services are inadequate. Still, as one participant remarked, services within the Kauhajoki centre are so good that there is no need to drive further away, for example to Seinäjoki, to access services. This might not be the case in every small rural municipality and people may need to travel even longer distances.

Another barrier to adopting certain low-carbon practices was their non-existence in rural areas. This was namely the case with mobility as a service (MaaS) arrangements and home delivery of goods. The interviews were conducted before the outbreak of COVID-19 pandemic in Finland during which home delivery services have been implemented also in Kauhajoki and time will tell whether they will stay in place in the future.

A more niche but still very impactful barrier observed by some participants relates to the availability of plant-based meals in the public schools of Kauhajoki. School menus rely heavily on meat-based dishes and plant-based diets are deemed special diets, as is the case in many Finnish schools especially ones that are not situated in the most urban areas Hinkula, 2018). Alleviating this conservativeness in school menus could help normalize plant-based foods in the minds of the rural youth.

> *"Carrot patties is one meal served in the school cafeteria that is totally plant-based, but it is not really considered here that plant-based food could be served to everyone, so they are not in the menu. So, it is just a special diet that plant-based…", P4*

Luckily, availability of low-carbon services and goods in rural areas was discussed also in positive terms. For example, one participant stated that plant-based food is available in local stores. Still, it should be noted that Kauhajoki hosts a versatile selection of large supermarkets, for example K-Citymarket, which makes it different from many other rural

towns with smaller shops and selections. Continuing on food, another participant remarked how the availability of "true" local food is adequate in Kauhajoki given its proximity to areas with lots of food producers such as Närpiö.

Many participants mentioned the subject of local biogas production in Kauhajoki. Apparently, the biogas plant has not been working perfectly (Pelkonen, 2018) but I could not find any news on the current situation of the plant. The participants voiced similar feelings of uncertainty and lack of knowledge about the current state of the biogas endeavour as is demonstrated by the following quote. The possible availability of local biogas has the potential to ignite interest in alternative fuels and boost adoption of biogas vehicles.

" ...well, there is this biogas undertaking that has been advanced in this village, so it is interesting, but I do not know whether they have finished it, they had some difficulties…", P6

Lastly, food waste app ResQ was discussed by many participants given that it was stated in the list of eating practices as an example of a service aiming at limiting food waste. Some stated that ResQ is available in the area (enabler) but not many restaurants use the service (barrier). It could then be said that in the case of the ResQ-app the question of availability turns into a question of utilizing available opportunities to their fullest potential. The existence of the ResQ-app could also be characterized as a technological enabler of food waste reduction and could therefore also be based in the category that is presented next.

5.2.2 Infrastructure and technology

While creating the categories, issues concerning infrastructure and technology were grouped together. Infrastructure and technology were present both in the realm of barriers and enablers. A broad range of issues was included into these categories and subsequently the categories somewhat overlap with issues of availability, rural space, and outside conditions. The barrier category *Infrastructure and technology* consists of barriers such as practical limitations of vehicles, deficiencies in waste management, and long distances. The similarly titled enabler category includes for example the existence of adequate and

developing infrastructure, and social media. Many barriers and enablers can be interpreted as being related to the rural context.

First, with respect to barriers, the participants recognized some shortcomings in municipal waste management. For example, biowaste is not collected separately in Kauhajoki which in the cases of some participants had led to not recycling it at all as it would require the setting up of one's own compost. Another barrier connected to waste management was the small number of waste types that had their own bins in row houses. While this is perhaps not strictly a rural concern, it still differs markedly from the most urban centres. As a result, in rural areas the possibilities to recycle differ very little regardless of the dwelling type of a person contributing to a universal need to store recycling before taking it to the recycling point. This might be harder to accomplish in small apartments compared to larger detached houses. Participants that lived in row houses also noted how the use of communal spaces was limited as the only communal spaces were storage spaces.

Continuing on waste management, well-situated recycling points are important everywhere but especially in rural areas where combining recycling with other errands is both economical and environmentally sound given the long distances as illustrated by the following quote. The importance of good placement of recycling points was highlighted also by Siirilä et al. (2013).

> *"Yes, a recycling point [with metal, glass and paper] is located about one kilometer from here and then plastic and cardboard, well, ten kilometers away but they are placed in the yard of a large store so you just kind of need to remember to take them with you in the morning.", P1*

In terms of alternative energy sources for cars (for example, electricity), the lack of charging stations was perceived as a barrier as is demonstrated by the following quote. The lack of charging stations could also be interpreted as a lack in availability as discussed in the previous sub-chapter in the case of biogas.

> *"Erm, replacing car with an electric one could be a great thing but here in the countryside not yet a noteworthy option in my opinion because of all the issues related to charging stations.", P8*

One participant speculated that making large changes to the heating system of a house, such as the installation of a ground source heat pump [GSHP], might be done rarely if the house was old. According to him, old existing building structures might then act as

barriers to adopting new energy solutions in rural areas as the houses there can be relatively older. The participant then corrected his remark and stated how heating solutions such as GSHP might actually be good in old and large houses given their high heating needs. In this example infrastructural issues are connected to financial considerations i.e. how installing GSHP could in the cases of old and large rural houses be a financially feasible choice.

Long distances as a barrier to low-carbon actions such as reducing private driving and cycling more were mentioned relatively little during the interviews. Perhaps this was due to the fact that most of the participants lived in or near the centre of the municipality, or maybe the fact was deemed self-explanatory. Still, long distances were explicitly identified as a barrier to adopting low-carbon practices by a few participants. In the following quote one participant pondered whether home delivery services could be considered as low-carbon in rural areas because of the distances.

"Yes, that may work in cities but [not when] you order the food to somewhere like Nummijärvi [a village in Kauhajoki] which is 30 kilometers away and then somebody sets out to bring it there.", P7

Another participant remarked how the possibility to tend to important matters remotely is especially relevant in rural areas because of the same reason: distances. Remotely accessible services made possible by technology could then act as an enabler of low-carbon practices in terms of that they would reduce the need to drive. From this perspective, advancing for example e-healthcare services in rural areas would provide environmental benefits in addition to accessibility benefits.

"Well I kind of hope that technology works so that it will be sensible, that you can tend to things from [Kauhajoki] without needing to drive a hundred kilometres for one everyday thing.", P1

Interestingly, one participant flipped the issue of distances onto its head and directed attention to the fact that even in a rural municipality such as Kauhajoki a significant proportion of inhabitants live near or in centre of the municipality where distances are relatively short. Without discrediting that distances are in many cases an irrevocable fact and a barrier it is interesting to consider how much unused potential for instance for cycling lies within rural centres. Same participant also stated how rural centres compared

to more urban centres are often safer spaces for cycling given the less-intensive traffic. Relatively safe traffic could then act as an enabling factor for low-carbon mobility.

"Yeah and well that, I suppose that also in here most of those trips are under five kilometers and they could be done by bicycle, and it could be safer than in Helsinki where they recklessly cycle every day.", P3

5.2.3 Rural space

The barrier category *Attractiveness of rural space* and the enabler category *Rural space* are both collections of codes that during the analysis phase were recognized as having a specific rural focus. The individual barriers and enablers ended up being heterogenous and these categories are a miscellaneous selection of rural observations.

Two barriers were placed in the barrier category. Firstly, the lack of tourist attractions and consequent lack of tourists was deemed a barrier to renting out a spare bedroom which was included in the lists of low-carbon practices. Secondly, one participant stated that given the placement of their home, making large energy renovations does not seem worthwhile. Although this statement relates to financial considerations, I wanted to highlight it on its own.

"Like I am going to argue that if this [house] was located ten kilometers away from the centre of Seinäjoki it would likely be worth it to invest in it in a totally different manner because we could probably actually sell it.", P1

In the statement the participant compares the attractiveness of her residential area (about ten kilometres away from Kauhajoki centre) to a residential area near the region's capital Seinäjoki. By doing this she illustrates the heterogeneity of rural areas and how areas that are not in close proximity to larger regional centres might not gain the benefits of migration directed towards rural areas and how this relative remoteness might act as a barrier to making large low-carbon investments.

The most significant enablers placed in the category of *Rural space* were linked to the presence of large open spaces. As self-evident as it is, in rural areas people have a unique opportunity to produce food in a larger scale than in urban environments. Some participants stated that they or their close relatives produced potatoes themselves. Still, it should be noted that here the line between food produced for own purposes and for

commercial sale can be blurred, as all of the participants did not explicitly mention the scale on which they produced the food.

"Erm, yeah we eat clearly more potato than rice. That stems from the fact that we grow it ourselves.", P1

Perhaps a more interesting statement made by one of the participants as cited below framed rural space as an enabler of low-carbon energy solutions. Large, open plots that can be found especially in the more sparsely populated rural areas offer optimal spaces for installing solar panels and collectors as they help maximize benefits of the oftentimes limited amount of sunshine through lack of shading.

"And it is suitable here in rural areas, in that sense that it fits to open places, especially here in Ostrobothnia, when you compare to some city where firstly there is not much plot space to put them so that they directly face south as other buildings or trees create shade. So, in that sense here in the expanses [of Ostrobothnia] utilizing solar energy works really well.", P4

5.2.4 Outside conditions

This category could alternatively be named "What's the weather like?". Only barriers were associated with outside conditions. Most of the remarks were connected to how poor weather conditions made cycling and walking less desirable. Also, the slipperiness of roads was mentioned. Although the effect of weather can be considered a universal one, one participant stated that rural road infrastructure may pose an additional challenge to cycling in winter conditions as the smaller dirt roads may not be tended to properly and can be particularly slippery. Weather conditions are in this case closely connected with limitations stemming from infrastructure and its maintenance.

5.2.5 Political measures

The enabler category *Political measures* includes only a few mentions and the categorizing of the mentions is somewhat unsure. For example, I decided to categorize the enabler *financial incentives* here although one could also place it in the *Financial sensibility and frugality* category. In addition to incentives, remarks on certain quotas

(how in diesel there is always a certain portion of biodiesel) and requirements (regarding insulation) are placed here. None of the enablers have clear links to the rural context.

5.2.6 Other people

The participants recognized both barriers and enablers when it came to their social environment. For example, whether the participants had acquaintances with whom to carry out low-carbon practices such as ridesharing and what their partners' stance on low-carbon practices were, affected their ability to adopt them. Also, social norms in terms of plant-based eating and low-carbon living in general emerged as barriers. There were some barriers that had links to the rural context while enablers were of a more general nature. After presenting these barriers I will also recount one interesting observation regarding ridesharing and carsharing.

Social norms of meat eating were mentioned explicitly only few times. Still, the following quote highlights a relevant worry that one of the participants had experienced. Given that meat is such an integral part of Finnish diets (National Institute of Health and Welfare, 2018) it may not even occur to people that someone would not enjoy eating well-prepared meat. This can lead to mutual discomfort and the subsequent avoidance of these types of situations.

> *"Well, I am a somewhat picky eater so it does hamper social situations a bit as it is not taken into account, here in the countryside people do not think that someone might not eat meat that they have prepared so well. So that is, it affects negatively then, and I tend to avoid those kinds of situations quite much.", P3*

I think that the relevance of this social norm might be heightened in rural areas given the close proximity to food production and the statements that populate the discourse of some influential rural actors, for example how eating Finnish meat is in some instances framed as a "climate action" (*"ilmastoteko"*) (Central Union of Agricultural Producers and Forest Owners, 2018).

Although not related to any low-carbon practice in particular but instead to the broader attitudes toward environmental issues in rural areas the following remark by one of the

participants illustrates how in rural areas promoting environmental awareness might in some ways still be stigmatized.

"And then here "tree huggers" and "city huggers" [kaupunkipiipertäjät] are very easily labeled, like "it is easy to yell from the city, there is nothing here", so that shows maybe in the spirit and atmosphere here.", P8

An interesting observation that stands out from the interview data was how strongly the participants connected ridesharing to acquaintances. This made it seem that ridesharing was conceived as something that could only be exercised with people you already know. Still, one cannot make rigorous conclusions about the issue as the participants were not explicitly asked whether they would be willing to do rideshare with strangers. Another observation linked to carsharing was how a couple of the participants seemed to exhibit distrust when it came to the prospect of lending their car to strangers. It seems that being acquaintances is an integral component in the case of carsharing as well. I will return to this observation in the Discussion.

"But it does not work that way that anybody could ask to borrow my car…", P2

5.2.7 Financial considerations

There were lots of remarks regarding financial considerations in the interview data both in terms of barriers and enablers. The barriers and enablers were very much counterparts of one another: practices were deemed either unprofitable (barrier) or profitable (enabler), too expensive or sensibly priced, and one either had or did not have enough money to do them. Enablers also included the value of frugality. A multitude of practices from all three main themes of housing, mobility and diet were discussed with reference to financial considerations. Although many examples that the participants gave could be regarded as universal, for example the current expensiveness of electric cars, many remarks can be interpreted through a rural lens.

When it comes to barriers with links to the rural environment, one participant expressed her worry about the future value of her home, a worry shared by residents of many small rural towns of Finland as property prices have been dropping (Järvinen, 2019). Given the uncertainty of the housing market added to the fact that the house will not be her "forever

home" and the oldness of the property, discourage her from making large energy investments because of their probable unprofitability.

> *"I am going to say in the case of rural areas that the value of this house is probably something pitiful...and even if it were [not] completely pitiful it is very probable that there will not be anyone willing to buy it. Anyone who is excited to renovate or anyone like that. So, an investment into the future on the basis that somebody would be here at some point or that we could sell the house is probably not very sensible in financial terms.", P1*

Linked to housing practices, more precisely the practice of moving into a smaller place, is the surprising barrier of cheap square meters. As illustrated by the following quote, the cheap house prices that populate many rural areas do not steer people to maximize small living spaces: on the contrary, they may push people to live in houses whose sizes are unnecessary large in terms of their actual needs. The participant stated how if she were living in a city, she might be more mindful of the needed living space.

> *"...and then, in a way, the living expenses [in a city] are more costly, so [there] I would think more carefully whether we need this many square meters, but here in the countryside it is a little bit cheaper so it does not matter so much.", P8*

As for enablers, one example is the financial sensibility of setting up one's own compost. Although not purely a rural concern, the long distances of rural areas make composting a feasible practice both in terms of personal benefits from diminished costs as the collection intervals for regular waste bins can be lengthened, and in terms of broader environmental benefits as the routes of garbage trucks could be optimized. Thus, the practice of composting can provide a sense of environmental accomplishment on a larger scale.

> *"...[Compost] has enabled lengthened collection intervals, which actually affects how much the garbage truck has to drive and then of course we do not have to pay so often.", P4*

Furthermore, the possible feasibility of electric cars was linked to rural distances by one of the participants. She stated how an electric car could be judged to be inexpensive if one would need to drive a lot given the non-existent fuel costs. When it comes to mobility one participant also speculated whether reducing the price for bus transportation would increase its demand in rural areas. Indeed, the question of cost has been recognized as one

key point in whether people are willing to use public transport (Chatterton, Coulter, Musselwhite, Lyons, & Clegg, 2009).

Albeit frugality cannot rightly be regarded as a value that is held only by people living in a certain area, I would like to highlight its role as an enabler of action. As seen in the following quote, practicing the value of frugality can be tightly connected with practicing environmentalism. I will return to this observation briefly in the Discussion.

> *"Well, environmental consciousness is perhaps partly also a kind of basic stinginess. So, so, when you drive ten kilometers to work you go to the shops during the commute, you do not first drive home and then go to the centre again to shop, so...I would say that in my case it is both an environmental and a money-related issue.", P1*

5.2.8 Knowledge

In the interviews, knowledge was discussed both in terms of barriers and enablers. Barriers to do with knowledge included for example not having enough information about some practice or the general scarcity of knowledge to do with certain practices. Enablers on the other hand entailed for instance how growing awareness and amount of information regarding environmental issues had pushed people to take action or at least made them think about the issue more. Knowledge considerations were linked to all types of low-carbon practices and they were mainly universal meaning that they did not have specific links to the residential context.

One particular case that emerged in a few interviews was unfamiliarity and lack of knowledge to do with mobility as a service (MaaS). This could be linked to the current non-existent availability of these services in rural areas.

> *"No no, I am not at all familiar with that [MaaS], not even as an idea.", P2*

Still, one cannot strictly say that this is specifically a rural barrier as MaaS might not yet be that familiar in urban areas either given that the concept is still very new and unclear in some respects (Jittrapirom et al., 2017).

5.2.9 Time

Both time-related barriers and enablers emerged from the interview data. Barriers linked to time included for example the lack of it and the time-consuming nature of low-carbon

practices. Enablers on the other hand included having time to adopt low-carbon practices and how low-carbon practices can save time. Barriers and enablers concerning time were mostly not related to the rural context, but some mentions were somewhat linked to it.

One participant brought up an example that was connected to both time and the availability of public transport which as mentioned before is a significant barrier pertaining to its use in rural areas. He stated how bus schedules to Seinäjoki were not properly linked to the schedules of trains that stop at the Seinäjoki railway station. This in his view forces people to drive to Seinäjoki by car in order to catch the train without needing to wait around for an unreasonable time. Here then the need to save time comes into conflict with poorly designed bus schedules. Interestingly, the participant speculated that the current mismatch in schedules was due to how they had been changed to fit the needs of a new vocational school halfway between Kauhajoki and Seinäjoki. What this case seems to show are the consequences that have arisen from changing public transport to fit the needs of one organization without prioritizing the needs of other actors.

Another observation which in my interpretation is linked to the rural environment is how combining trips together (for example commuting to and from work and grocery shopping) was considered a very commonplace practice. As one participant aptly put it:

> *"I do try to [combine trips together], it also saves time. So, I have never considered it from an environmental perspective, but from the perspective of time.", P7*

Even though this observation might ring true also in more urban areas, in rural areas where grocery stores might be tens of kilometres away from people's homes, saving time can act as a powerful driver for people to combine trips. On a more general level this example highlights well how prioritizing other concerns instead of environmental ones can still enable environmentally sound behaviour.

5.2.10 Habitual behaviour and thoughts

The barrier category *Locked-in habits and thoughts* and enabler category *Forming habits* ended up being a mix of various issues. The main point of these categories is however the habitual nature of current high-carbon practices and ways of thinking that reinforce the habituality, and on the other hand how conceiving low-carbon practices as habits can help them stick. Barriers that emerged from the data were for example how the participants

were used to reproducing practices with high carbon intensities and how trying to make conscious changes was overridden by the habitual nature of current behaviour. Enablers included for instance how low-carbon practices had become a part of the daily fabric of the participants' lives and how they did not need to consciously think about upkeeping them. The barriers and enablers were linked to a range of low-carbon practices, for example reducing private driving and recycling. The findings of these categories can be mostly interpreted as being universal, but some observations have special rural relevance.

Regarding barriers, the habitual nature of private driving was explicitly mentioned in a couple of interviews. As is evident, private driving constitutes a practice whose replacement faces a range of barriers in rural areas. It is very common that partners or families that live in rural areas own more than one vehicle (Siirilä et al., 2013). In the following interview quote one can see how even though the participant does recognize that having two cars might not be necessary for her family, the fact that she and her partner have always had their own cars bypasses this recognition. Conscious awareness of the redundancy of having two cars is not enough to break the habit of owning them. Still, it should be noted that in this particular case my answer to the first remark may have had an effect on how she continued.

P8: "Erm, we have two cars, we could make do with one."

Interviewer: "Has it just happened at some point and then stayed?"

P8: "I guess it has, both of us have always had cars so through that then."

Contrasting the aforementioned is the following quote which represents one enabler that may help overcome old habits: flexibility. In this instance, the participant and her partner had owned two cars but one of them had broken down after which they had not bought another one to replace it. As she states, flexibility and humour have helped them to adjust to the change in driving practices that have resulted from having only one car.

> *"Well we have always laughed that we used to have two cars but when the other car broke down, we came to the conclusion that we will not get another one. So, so, as it was not necessary for work purposes. We have gotten by with one car. It requires conciliation and flexibility...but there is something to talk about at least [laughter].", P1*

Another interesting observation of a barrier made by one the participants concerns cycling and more specifically using an electric bicycle. He brought up how some people may see

cycling purely as a form of exercise rather than as a means to commute or travel intentionally from place A to B. The observation represents a locked-in thought. In the case of electric bicycles this view would then mean the rejection of them on the basis that they make cycling too easy and are at odds with the exercise aspect. In a later interview another participant did mention how even though she could picture herself using an electric bicycle, using it would not really count as exercise. Albeit this observation may not only pertain to rural areas, given how the short distances of rural centres could provide opportunities for cycling and how these opportunities seem to go underutilized, it would be interesting to examine how people view cycling in these areas. It could be that restricted meanings linked to the act of cycling as a form of exercise could act as barriers to implementing the act in different spheres of life.

5.2.11 Life situation and experiences

Barrier and enabler categories titled *Life situation and experiences* are collections of issues that are connected to the current life situation of the participants (here understood as linked to family size, dwelling type, work obligations, and hobbies) and past experiences which are constituted by the background of the participants and their previous experiences with low-carbon practices. Barriers include for example having work obligations that necessitate driving or inhibit working remotely, children limiting the possibility to make certain choices, failed experiences with low-carbon practices, and how living in a row house limits the decisions one can make in terms of low-carbon energy. Enablers on the other hand include for instance having learned the value of frugality from one's family, possibility to practice low-carbon actions together with one's child and having one's own yard. Barriers and enablers were mostly not linked to the rural context, but some examples did emerge.

One participant remarked how her work obligations combined with the lack of public transport and long distances create the need for her to drive. This shows how multiple factors converge together to create circumstances which obstruct the possibility to adopt low-carbon practices. Another participant touched upon the significance of family background and speculated whether the education levels of some rural families may lead to a lack of environmental knowledge within these families. The average education level in South Ostrobothnia is lower than for example in Uusimaa (Statistics Finland, 2020) but making too wide generalizations here could stray into creating unnecessary rifts. In

terms of enablers, multiple participants stated that they had a small backyard garden. This observation is tightly linked with the category of *Rural space*.

An interesting point regarding the importance of background was mentioned by one of the participants. He described that as he and his partner were originally not from Ostrobothnia, he felt that they did not have a special connection with the land. He speculated that if they had this connection, they might be more prone to purchasing local food.

> *"Maybe it is visible that we do not hail from here, from Ostrobothnia, as we do not have that kind of native love for the land that would affect us so that we would, like, buy food that is produced in our parents' homesteads.", P4*

This remark was interesting from two perspectives. Firstly, it illustrates how it should not be presumed that all rural dwellers have an inherent love for their region. It may be too easy to make broad generalizations of rural dwellers who are "stuck" to their lands and forget that rural people are a heterogenous group. Secondly, it highlights how being committed to some area might induce adopting low-carbon practices that in addition to being climate-friendly are important in upkeeping the local community.

5.2.12 Perceptions of difficulty, easiness, and distance

Next, I will go through the barrier category *Perceptions of difficulty and distance* and the enabler category *Perceptions of easiness and sensibility*. In the former the following barriers are included: perceiving that low-carbon practices are difficult or high-carbon practices are impossible to give up, and perceiving environmental issues to be distant in the sense that the consequences of them happen somewhere else and one's own actions only go so far. For example, going totally plant-based was perceived to be difficult and some participants stated that given that their air travel was already very minimal it was irrelevant to give up flying completely. The enabler category consists of three main enablers: perceiving low-carbon practices as easy to do, practicing them when they seem sensible, and giving up carbon intensive practices partially instead of completely. For example, taking a train when travelling to Helsinki was perceived to be easier than going by car as in the case of train there is no need to worry about parking. Also, the participants saw the act of increasing the share of plant-based products in their diet instead of going fully vegan as more sensible given that this would make the practice more accessible to

people who may not want to give up meat totally. In terms of rural links, barriers dominated over enablers.

The participants perceived that some practices were difficult to carry out while living in a rural area. The perceptions of difficulty were closely connected to barriers linked with availability of services and infrastructure. For example, using public transport was deemed difficult. Additionally, one participant stated how maintaining a compost seems difficult which together with the non-collection of biowaste contributed to disposing it together with mixed waste. The same participant stated how it takes a lot of effort to find certain so-called eco-products such as detergents in Kauhajoki. Even though they might be available in some stores the act of paying attention to each particular product and acquiring them possibly from several different stores felt unnecessarily difficult.

Furthermore, having a car was deemed compulsory, although explicitly only by a couple of the participants. As the following quote demonstrates, owning one's own car was considered obligatory as without it one would be "stuck" in one place. After this remark the participant further demonstrated the need by referring to the non-existent public transport services. As the latter sentence of the quote illustrates, the act of owning a car seems to provide a sense of flexibility and safety to the owner when contrasted with joint use type arrangements. One's own car is always there, ready, and easy to use.

> *"Well giving up one's own car and stuff like that just does not work here in the countryside. You cannot get anywhere [without it]… --- And then when the need is daily or like that, then it anyhow has to be your own car not a joint car or a rental one or anything like that.", P7*

There is also the issue of environmental problems not being visible to the rural public, titled here as *distance*. For example, participants in Ovaskainen (2019) mentioned how in Lapland the capacity of nature may seem infinite to rural dwellers given that nature is such a prominent feature of rural landscapes. In my interview data one participant related a practical example of this phenomenon. She stated how in cities pollution is perceived in a much more concrete manner as for example car exhaust fumes and street dust populate the air to a larger degree than in rural areas where traffic is rarely congested. This might create distance between rural dwellers and the very practical consequences of

environmental degradation and lead to a lesser interest in making changes to the status quo.

5.2.13 Feelings and preferences

How the participants felt about low-carbon practices and what personal preferences they had, emerged from the data as factors that influenced whether they seemed to be prone to adopt these practices. The barrier category *Feelings and preferences* includes for example following types of issues: negative and unpleasant emotions such as stress (for example the inability to use ResQ-app) and wanting to avoid these emotions, feeling that a low-carbon practice is useless, uninteresting or unconvincing (vegan diet for example), and feeling the need for privacy (inhibiting renting out spare bedrooms). Also, a preference for certain tastes emerged as a barrier that was linked to plant-based eating. Comparably, positive feelings about low-carbon practices or negative feelings about not continuing these practices (for example recycling) acted as enablers. Enablers included also having a personal preference and taste preference for a low-carbon practice, such as not liking the act of going to the sauna or the taste of meat. In addition to these the enabler category titled *Feelings, values and preferences* included the observation of how participants' values were sometimes directly manifested in their behaviour, for example when it came to avoiding flying. None of the aforementioned barriers and enablers were outright connected to the rural dwelling context.

5.2.14 Health and well-being

Considerations of health and well-being covered both barriers and enablers. Most of the barriers pertained to plant-based eating while enablers had links to plant-based eating and cycling. The barriers and enablers were mostly universal in nature, for example, dietary problems arising from legumes and other plant-based alternatives (barrier) and the health benefits of cycling (enabler).

In terms of the rural context, one participant mentioned that cycling can be a strenuous option during a long week at work because of the relatively long commute distance that she had. The remark is connected to long rural distances that overcome the significance

of health considerations as an enabler. This illustrates how barriers and enablers deriving from different dimensions can act against one another.

5.2.15 Conflicting issues

The barrier category *Conflicting issues* had no corresponding enabler category. This category included for example observations about how different values deriving from environmental concern can still be in conflict, how wanting to follow given instructions can lead to the need of turning down low-carbon practices (mentioned in the context of washing clothes), and how low-carbon actions may also have detrimental consequences (for instance the case of electric car batteries and mining practices). The barriers categorized here were not specifically linked to the rural dwelling context although one exception emerged.

One vegetarian participant expressed how valuing both climate change mitigation and the upkeeping of agricultural heritage habitats (*"perinnebiotooppi"*) created internal conflict in her views about plant-based eating. Both issues are linked to environmental concerns, climate change and biodiversity loss, but their conflict arises from the use of livestock in maintaining the heritage habitats and the carbon emissions of this livestock. This shows the multiplicity of environmental values and how their perceived friction can create anxiety in people who hold both perspectives important (also discussed by Evans & Abrahamse, 2009).

> *"And then I do kind of agonize over the fact that I do perceive the importance of agricultural heritage habitats that require a grazing animal. -- Or I consider the existence of agricultural heritage habitat livestock good and it does not make me, you know. Perhaps because I have after all always lived in a rural area, so it is quite normal that somebody always gets eaten [laughter]. But then that kind of meat that has been bred only for eating purposes feels strange.", P1*

After expressing her conflicting thoughts, the participant eases the internal friction by redirecting attention to ethical considerations by comparing eating small-scale livestock kept for purposes of managing agricultural heritage sites with consuming livestock bred purely for eating purposes. The identification of this difference seems to stem from her experiences living in a rural area and seeing her father breed small-scale livestock. By identifying this difference, she clarifies her ethical position on the matter and directs the discussion away from the friction between biodiversity conservation and greenhouse gas

emissions toward the ethically “simpler” issue of small-scale versus industrial meat production.

6 Discussion

In this chapter I will deliberate on the results of this study in light of previous literature on the topic. First, I will offer some general observations concerning the barrier-enabler dualities that emerged from the results. Secondly, I will discuss how the rural context was present in the results. Thirdly, few thoughts on using the Finnish Innovation Fund Sitra’s list of sustainable actions as a proxy of low-carbon practices are elaborated upon. After this, the practical implications of the results and possible follow-up research directions are pondered upon. Lastly, some limitations of this study are presented.

6.1 Barriers and enablers: linkages to many aspects of life

As expected, a value-action gap emerged from the interviews (Kollmuss & Agyeman, 2002). The participants, although to varying degrees, considered environmentally sustainable and low-carbon living to be important but their behaviour at times did not match these considerations. This showcases that other factors, titled as barriers in this thesis, affect the absorption of low-carbon practices. The results reaffirm the current views on lifestyles that focus not only on the motivations of the individual but strongly assert that also contextual factors external to factors such as values or motivation play a significant part in these processes (Jackson & Smith, 2018; Barr, 2015). On the other hand, the results also confirmed that values that are not primarily environmental can also positively influence the adoption of low-carbon practices (Evans & Abrahamse, 2009). These values, such as frugality, acted in some cases as enablers of low-carbon living.

The results of this study correspond quite well to previous research literature. The barriers are mainly consistent with barriers identified in studies concerning for example climate change action (González-Hernández et al., 2019), engaging with climate change (Lorenzoni et al., 2007), and sustainable and ecological lifestyles (Axon, 2017; Ovaskainen, 2019). Although I was not able to find many satisfyingly similar studies on enablers (Axon, 2017; a review of a particular practice by Graça et al., 2019a) it seems that an inclusive assortment of enablers emerged from the interviews. This conclusion is due to the observation that the barrier and enabler categories coincide well as can be

observed from Tables 1 and 2. It might even be said that barriers and enablers mirror one another but in this case the mirror shows a negative image: the lack of some resource and experiencing an unpleasant feeling are contrasted with having that resource and experiencing a positive feeling.

Referring to the often-used internal-external distinction (for example González-Hernández et al., 2019) barrier and enabler categories that could be classified as internal such as categories related to feelings and perceptions or external such as categories related to infrastructure and the availability of services were well represented. To divide the observations within this distinction is however not unambiguous which is why I have decided to refrain from doing it. The issues that the barrier and enabler categories aim to represent can be examined from various perspectives: take health for example. The importance of health and well-being could be interpreted as an internal issue. It is something that people experience themselves and to a large extent they themselves are in control of their own experience of physical well-being. Still, health considerations can be construed also as external issues as what we see as healthy, for example in terms of food, is often determined by institutions such as the Finnish Food Authority and is influenced by people around us. If other people continue spreading horror stories of "veganism gone wrong" we might be more prone to being suspicious of the nutritional consequences of plant-based low-carbon practices. Health could then be interpreted as an amalgamation of our internal feelings and the social structure we live in.

Even though the results of this study included a wide range of barriers and enablers, it could be said that some categories were underrepresented when compared to previous research. For example, in Axon (2017) participants recognized the importance of governmental and collective action as a barrier and driver of adopting sustainable lifestyles in the long-term. However, in my study these issues were mentioned quite rarely. Social environment came up mainly, although not purely, through mentions of closest family and acquaintances. Political environment on the other hand was noticeably absent from the data and the few mentions that could be interpreted as having clear links to the regulatory structures were mainly related to financial incentives.

The absence of mentions of the wider political as well as cultural climate as a barrier or an enabler of low-carbon lifestyle change could be due to many reasons. One possible reason for this could have been the structure of the interviews. The focal point of each

interview was the practical everyday life of the participants. This might have directed their attention away from the political and cultural background, as although these backgrounds structure the manifestations of everyday life, they may not be actively thought upon in the midst of living the day-to-day as they as Kogl (2009, p. 515) states are “too close”. When it comes to the relative rarity of barriers and enablers related to the wider social environment one explanatory feature might be that none of the participants lived an extremely “eco-life” or diverted from the norm of living, one example of which could be dwelling in an ecovillage or a co-housing community (Daly, 2017). Through mainly conforming to “normal” ways of living the participants might not have been subjected to great social pressures in terms of their lifestyles which might explain the fewness of mentions related to the social and cultural environment at large.

6.1.1 Interconnected barriers and enablers

According to Lorenzoni et al. (2007) barriers to engagement with climate change are often connected and may form ensembles that function together in action obstructing ways. Evidence of this phenomenon could also be found in my data both in terms of barriers and enablers. Regarding barriers one example of this was already mentioned in the Results. When discussing the prospect of replacing her current heating system with a low-carbon one, one participant identified many barriers that together work against this energy renovation: the house being already quite old, the house not being their “forever home”, the consequent need to move out some day, the unlikeliness of being able to sell the house given its age and location, and the consequent likely unprofitability of an investment as large as the instalment of for example a GSHP. A corresponding example of enablers is related to the prospect of combining multiple trips into one, for instance commuting, doing a food shop and taking out the recycling. Combining these sorts of trips was made possible by well-situated recycling stations and motivated by the resulting savings in fuel money as well as time.

In addition to the connections within barriers (and enablers) as found out by Lorenzoni et al. (2007), my data shows that amalgamations do not happen only within barriers and enablers but also between them. Barriers and enablers are in an almost push-pull relationship, the winner of which determines whether a practice is adopted. An example of this was the case of the electric bicycle. Enablers that push forward the increased adoption of electric bicycles in a rural environment include for instance the possibly

unused potential for cycling in areas near rural centres, how e-bicycles enable cycling on longer distances compared to normal bicycles, the safe traffic of rural centres, saving fuel money, and health and fitness benefits. As a counterpart to the push that enablers are creating the following barriers can pull people further away from acquiring e-bicycles: bad weather, inadequate maintenance of dirt roads, and old conceptions of cycling purely as a form of exercise instead of as a mode of mobility. Thus, from the perspective of the barrier-enabler heuristics the adoption of low-carbon practices can be a case of who wins the push-pull competition.

Another observation is how low-carbon practices themselves can act as barriers to adopting other low-carbon practices. An example from the data showcases this in an interesting manner. The life situation of one participant could have enabled him to move into a smaller apartment (a low-carbon action) and he had pondered upon that option. In the same sentence he however stated that having installed a geothermal pump (a low-carbon action) in the current house and the resulting low heating costs were one reason for not actually moving. In this case the earlier acquirement of a low-carbon heating option acted as a barrier to reducing living space. It should however be noted that living space should have to be reduced significantly in order for it to be comparable to the carbon reduction of installing a heat pump (IGES et al., 2019). Still, although this is a singular example, it illustrates how there is significance in what practices get promoted first or most as they might deter people from taking consequent action down the line.

On the other hand, low-carbon practices can also act as enablers of following action. Adopting practices first in a smaller scale might lower the threshold of moving toward more radical practices for example by diminishing the perceived risks associated with the behaviour change (Gifford, 2011). Some participants discussed plant-based eating from the perspective of incremental change. One could hypothesize that weekly plant-based meals might act as socially-acceptable steppingstones to food practices that have an even larger mitigation impact.

Lorenzoni et al. (2007) state that not all people experience the various barriers to engagement uniformly. The notion of the subjectivity of barriers, extending also to enablers, was visible also in this study. For instance, perceptions of difficulty and easiness showcase this subjective nature, as what seems difficult or easy varies between people. Issues such as the availability of public transport may be perceived differently by different

people. For some insufficient public transport may lead to perceptions of insurmountable difficulty and lead to not using public transport at all while for others it might lead to only a slight feeling of stress which can be overcome through careful route planning.

By extracting both barriers and enablers from the interview data my plan was to provide a balanced analysis of various factors that affect behaviour in inducing or obstructing ways. However, a total balance was not arrived at as factors interpreted as barriers were mentioned more frequently than factors acting as enablers. My hypothesis for the reason of this imbalance is that it stems from the structure of the interview accompanied with a cognitive or affective tendency. Firstly, the interview structure did not strictly rely on the barrier-enabler duality but more on a format where participants were asked to freely relay their experiences with the listed low-carbon practices. I believe this structure made it easy for the participants to purely state the practices they had adopted without going into more detail on *why* they had adopted them or what had made the practices possible for them. On the other hand, when it came to the practices that they had not adopted I believe that they might have felt a stronger urge to explain themselves as to *why* they did *not* implement these practices. My hypothesis is that it is easy to just state what is done while what is not done is more likely to be accompanied with reasons for the inaction in order to avoid the embarrassment of, for example, seeming lazy or incompetent.

6.2 Living in a rural area: implications for low-carbon practices

When applying a rural lens to the results, more rurally relevant barriers than enablers emerge. This is consistent with the overall division found in the results. Most of the time while relating their experiences concerning the various low-carbon practices of housing, mobility and food, the participants did not explicitly link their views and perceptions to their rural living context. Identifying barriers and enablers with rural links necessitated some degree of interpretation, although this degree was in most cases very low, i.e., the links were mostly clearly visible.

Rural areas can be contradictory places which to some extent was visible in the results of this study. On one hand, the closeness of nature is an integral part of rural areas. Considering barriers and enablers, this closeness exhibited itself in terms of outside space and the resulting possibility of growing a share of one’s own food. In best cases the closeness of nature may lead to the adoption of sustainable practices as people might

experience a will to maintain the “pure” rural environment (Coisnon et al., 2019). On the other hand, a utilitarian view of natural resources can be more present in rural areas. Social closeness to industrial agricultural activity has been shown to lead to more positive attitudes toward resource extractive fields (Sharp & Adua, 2009) and even though the rural population is homogenous, comparatively more people in rural areas may have these close social links. The observation that participants did not actively discuss for example the ethics of animal agriculture when pondering about plant-based eating seems to point toward these views, at least partially. Still, given the contradictions within the relationship of rural areas and nature developing one’s own position toward low-carbon practices especially in realm of food might be difficult.

Within barriers and enablers linked to rural dwelling, there appears to be an emphasis on factors that for example González-Hernández et al. (2019) would classify as external. While Graça et al. (2019a) state that barriers and enablers connected to motivation i.e. internal psychological processes are overrepresented in research on plant-based diets it seems that applying a place-focused lens on low-carbon practices brings forward more issues related to the physical environment. These results were to be expected as it is easy to see how a living environment structures the external conditions of life for instance by enabling certain types of mobility.

As stated in the Results, the rural living context of the participants was mostly present in barrier and enabler categories related to infrastructure, and the availability of services and products. Barriers to low-carbon action such as the inadequacy of public transport services, long distances, and a waste management system where the role of public recycling points is highlighted have been recognized also by Siirilä et al. (2013) and Ovaskainen (2019). Even though many of the rural barriers were familiar, there were also surprising observations, one of which was how lower housing prices (when compared to urban areas) might lead to people heating and dwelling in homes that are larger than their actual needs would be.

Regarding enablers, one factor that was anticipated was space. Space exhibited itself mainly as having backyards as none of the participants lived in an apartment building (*kerrostalo*). Having a backyard enabled at least three types of low-carbon practices: maintaining a garden with food plants, installing low-carbon energy sources such as solar

panels or collectors, and drying laundry outside. In terms of mobility space will be discussed in the following sub-chapter.

A presumption that has persisted as a part of our collective view of the social environment of Finnish rural areas is an atmosphere of narrow-minded or conservative values (Malmsten, 2004). Perhaps somewhat surprisingly the supposed conservativeness of the social environment was mentioned in the interviews only a couple of times, firstly in terms of plant-based eating and how it challenges the norm of meat-eating, and secondly in terms of how acting in an environmentally sustainable way might in rural areas label one as a "hippie" sort of person. Despite these few mentions, people did not seem to see the opinions of their fellow town residents as relevant to whether they adopted certain practices or not. Either this is the case, or the reason lies in the previously mentioned characteristics of the participants as none were leading an extremely "eco-life". In this respect, it should also be mentioned that the most impactful low-carbon practices that the participants had adopted were technological in nature (for example, low-carbon heating options instead of veganism). It might be that low-carbon actions stemming from technological advancement might be more readily socially accepted while actions that are often seen as value-laden such as veganism might face stronger social pressure for conformity. The culturally entrenched meanings of meat eating and the consequent resistance for plant-based diets can be especially visible in rural areas as in the case of Kaljonen, Peltola, Salo, and Furman (2019) where experimental introduction of vegetarian food in rural schools incited rejection particularly from boy students.

Lastly, the importance of frugality stood out in the interviews. As mentioned earlier, other values than purely environmental ones have the possibility to induce low-carbon and sustainable lifestyles (Evans & Abrahamse, 2009). Frugality was perceived as an important value by many participants. It was exhibited in the importance of cutting out unnecessary consumption for example when it came to electricity and driving, as well as in terms of valuing existing resources by for instance limiting food waste and wanting to upkeep old appliances. Although the value of frugality cannot only be linked to rural communities, the finding is congruent with the results of Heinonen and Junnila (2011). According to them the carbon loads of Finnish individuals decrease in tune with their income levels. Given that the average income levels are lower in rural areas these areas are prone to a lower degree of carbon-intensive "excess" consumption. It could then be

said that frugality as an enabler of low-carbon consumption habits might be more prevalent in rural than in urban areas.

6.2.1 Mobility in a rural area: diverting expectations

Given the infrastructural and availability characteristics of rural areas, private driving plays a significant role in rural mobility (Ovaskainen, 2019). Mobility is therefore a central issue of rural low-carbon lifestyle change which is why I want to highlight certain observations linked to it that came up in the data.

A high degree of communal spirit is often present in conceptions of Finnish countryside (Malmsten, 2004). In Finnish we talk about village communities (*kyläyhteisö*) where people share resources and effort with each other. In my research data the assumed communality of rural areas was mostly absent, in the case of mobility in an intriguing way. When participants were articulating their thoughts on ride- or carsharing the notion of knowing the people with whom these actions would be done seemed important. For example, ridesharing was framed in the discussions only through acquaintances and the prospect of sharing rides with strangers was not mentioned. With carsharing some participants expressed how they would experience distrust if they had to lend their car to a stranger.

I wanted to bring forth this observation here as although it is not strictly related to the rural living context of the participants it averts expectations of the aforementioned rural communal spirit and the assumption that in rural areas people trust one another to a higher degree than in urban areas. A possible explanation for this discovery is that given that owning a car is considered obligatory in most rural areas, lending the car to a stranger leaves the owner more vulnerable. The car can represent a sense of safety and self-efficacy as one might be dependent on it for mobility purposes. Another cause for this might stem from the residential areas of the participants as nearly all of them lived near the centre of the municipality. Perhaps in the more remote villages the situation might be different as people there might feel a stronger sense of social cohesion. On the other hand, in remote areas people are even more dependent on their cars which might lead to a reverse situation.

Mobility incited other interesting points as well. One of them was the unused potential for cycling that might be present in rural centres and in areas close to these centres. In

terms of mobility, long distances are often conceived to be the norm in rural areas. While this holds true in many cases it might direct attention away from possibilities focusing on other modes of transport. This phenomenon could be seen in my data as even though most of the participants lived near the centre of Kauhajoki not all of them had particularly optimistic views about alternative mobility modes. It is important to consider the meanings linked to these alternatives, as can be seen with cycling: conceiving cycling as a form of exercise might deter people from conceiving it as a substitute for car use for example in the form of e-bicycles.

Still, the importance of the private car cannot be ignored in a rural environment. What however could be examined more closely is the number of those private cars. In the region of South Ostrobothnia, the number of cars per citizens was the highest in Finland in the year 2018: nearly 600 cars per 1000 citizens (Traficom, 2019). It would be important to critically examine whether having, for example, a car for each adult of the household stems from actual needs (for instance, highly differing and strict schedules) and whether a part of it is actually just habitual. As relayed in the Results one of the participants noted how having two cars (in a household with two adults) had happened organically without much critical consideration. Each of them had owned their own car before so continuing to keep both was easy and convenient. It could then be said that a part of the practice of having these two cars is habitual in nature. On the other hand, the case of another participant who previously had two cars in her household but nowadays only one due to the other one breaking down shows how abrupt breaking of a habit can lead to the formation of new habits even though these habits might have at first been deemed problematic. As the latter case underlines there is slack to be cut in the number of cars in rural areas. However, we cannot presume that this type of abrupt change will happen in a wide capacity meaning that other approaches to the issue are needed. The solution for mobility in rural areas should not be the absolute shunning of private cars as that can lead to tensions between populations living in different physical realities. Instead, the critical consideration of owning private cars could be framed as a less-is-more situation where

having one fewer car equals to having more financial resources for other activities, preferably low-carbon ones.

6.3 Low-carbon practices not taken at face value

As I gathered up the results, I focused on examining barriers and enablers related to a certain practice without considering the actual sustainability or carbon impact that the practice would have in the dwelling context of the participants. The participants however did not always take the practices that were presented to them at face value in terms of their sustainability and instead problematized them. This happened in two ways. Firstly, some participants questioned the low-carbon status of the practices by referring to the circumstances of rural area. An example of this was the practice of home delivery of goods and its connection to the long distances of rural areas. Secondly, when it came to practices such as updating one's home appliances to more energy efficient ones, many participants brought forth the importance of material efficiency, and how from that perspective, holding on to old appliances could be beneficial.

These examples show how the participants were to some extent able to critically look at the practices and situate them in the rural circumstances in which they lived in, and additionally, how they considered also other environmental aspects of the practices apart from the climate impacts. The first example in particular showcases an important perspective of place-based realities that should be taken into account when using information dissemination as a tool for pushing behaviour change forward. Sitra's 100 smart ways to live sustainably-website (Sitra, n.d.-a) represents one instance where sustainable acts are disseminated to the whole of the public. Even though the effect of place of residence is mentioned in the descriptions of some acts (not on the header level), instances such as 100 smart ways could benefit from a place-based filter that would instantly highlight practices that are most actionable (less barriers, more enablers) in a given place, and thus make adopting low-carbon practices seem as easy as possible.

6.4 Ideas for practice and future research

The barriers and enablers found in this study add to the choir of results derived in studies such as Axon (2017) that highlight the need for a multifaceted approach to empowering individuals to change their behaviour toward a low-carbon direction. Given the wide

range of barriers and the variety of possible enablers of change, action is necessary on multiple levels ranging from enforcing positive feelings incited by low-carbon practices to providing infrastructure and financial instruments that are congruent to these efforts.

It matters, what we are talking about when promoting low-carbon practices. Because of the value-action gap, relying on climate and sustainability benefits while marketing low-carbon practices is necessarily not the most effective strategy. Even the people who care find themselves making choices in a constant push-pull environment of different barriers and enablers. For example, financial factors are a fact of everyday life that people are bound to consider when thinking about making changes in their lifestyles. Utilizing the importance of financial considerations could in the case of promoting rural low-carbon mobility mean taking the barrier of long distances and framing it in such a way that emphasizes the fuel expense benefits of acquiring an electric car instead of continuing to promote electric cars “sustainability first".

Lorenzoni et al. (2007) frame their study of barriers through the lens of engagement which to them consists of three dimensions: cognitive, affective, and behavioural, all of which are affected by the social and institutional contexts of the individual. As the authors of the paper state, people need all of these factors in order to realize their engagement to its fullest potential: one has to have knowledge about the, one has to be emotionally invested in the issue, and one has to have the possibility to act upon the issue. In addition, other actors might have to care about the issue too. To me, this conceptualization of engagement highlights the need to focus efforts on combating barriers and lifting up enablers on multiple fronts at the same time without focusing too strictly on one aspect of engagement. In rural areas we must be careful not to focus purely on alleviating the much-discussed physical barriers: even if we finally supplied every small rural town with charging stations, if people cannot let go of the old feeling that electric cars “just do not work in the countryside” and if people feel incompetent in the face of this technology, change might not happen. All in all, given the diversity of barriers and enablers, and the dimensions of inciting engagement all eggs should not be put in the same basket.

Research such as this study and Siirilä et al. (2013) highlight the need to ensure that the voices of people living in different residential areas are given space in the discussion on which climate actions should and could be implemented in these areas. Lorenzoni et al. (2007) frame the importance of involving a multitude of stakeholder groups in policy-

making as enforcing trust in the process. From a place-based perspective the involvement of different people can help assure that the decisions that regard these particular places are done with a sense of fairness, specificity, reasonableness, and with respect to the circumstances of the place.

In terms of future research, I would like to articulate three points. Firstly, as the example case of cycling shows, existing meanings of low-carbon practices can act as unlikely barriers. It is therefore important to carry on work that examines what meanings people attach to different low-carbon practices. Approaches of practice theory which were not discussed in this paper are of great value in this work. Secondly, research utilizing the barrier-enabler heuristic seems to have been more focused on uncovering barriers, and even though the design of this study aimed at providing a balanced look at enablers as well the results were still tilted towards barriers. As climate change action is quickly becoming a part of the everyday life in Finland through international, national, and communal climate goals, an increased focus on carefully classifying what enables action would be beneficial. In addition to the importance of a continued effort to uncover enablers it is also highly important to communicate them to people. Focusing on the positive instead of only on the negative is crucial if we want to enable people to take up low-carbon practices. Lastly, place-based climate road maps have been and are being prepared all over the country. Including studies on factors that local people perceive to be hindering or enabling climate action in the process can assist in finding out what are the routes along which climate action could face less resistance.

6.5 Limitations of the study

Lastly, I will present some limitations of this thesis study. There are multiple factors that implicate the limited transferability and representativeness of the results regarding people living in other rural towns of Finland and other types of people living in Kauhajoki (Drisko & Maschi, 2015). The sample size of the study was quite small, only eight participants. The medium through which participants were mainly sought confined the possible sample to people who use Facebook. The age range of the sample tilted towards middle-aged and no participant was under 30 years old. Given the scope of a master's thesis the sample size should however be satisfactory. Through Facebook I was able to reach people with the desired characteristics, a Kauhajoki resident with positive

environmental attitudes, conveniently. Even though the age range of the participants was not as wide as possible the sample displayed diversity in some respects for example in terms of dwelling type and whether they had children.

Although being a conscious research design choice the fact that all of the participants exhibited a varying degree of positive environmental attitude, this restriction excluded people with negative or indifferent views about environmental issues who might have had additional insights on barriers and possibly also enablers. Studying the non-interested or people with negative attitudes would be an interesting research subject on its own right. Also, I did not place an explicit "threshold" on how intensely environmentally invested the participants needed to be. This lack of refinement resulted in a group of participants that had non-uniform levels of interest. Nevertheless, I think that this heterogeneity resulted in more compelling results when compared to a hypothetical situation where I had reached only participants with more fundamental commitments to ecological living which could have obscured the trials that so-called ordinary people experience.

Choosing Kauhajoki to represent a Finnish rural town can be contested given that compared to some municipalities of Finland (Association of Finnish Local and Regional Authorities, 2019), Kauhajoki has a quite large population and considerably good services especially in the retail sector. The population centre of Kauhajoki has in the current GIS-based urban-rural classification been classified as a local centre in rural area and is surrounded mainly by rural heartland areas (Helminen et al., 2020). Thus, the situation in Kauhajoki cannot be directly compared to, for example, Northern and Eastern Finland where sparsely populated rural areas dominate the map.

Using multiple coders in conducting content analysis is an often-used way to enhance the reliability of the analysis (Erlingsson & Brysiewicz, 2017). Given that I was the sole person working on this study, this practice of consensus and feedback-based refinement of the codes was not available. Also, given that coding, especially connotative coding requires practice and a deep understanding of the issue at hand (Drisko & Maschi, 2015), my inexperience sets certain limitations to the results of this study.

As a final remark, in hindsight I could have narrowed the focus of the study. Examining barriers and enablers connected to low-carbon practices at large did result in a diverse body of results but at the same time made the results connected to individual practices

somewhat thin as there were so many practices to go through during the interviews. If I had focused purely on a collection of a few practices I could have offered a more thorough analysis of the barriers and enablers related to each of them and put forth more rigorous practical guidelines for how to advance the uptake of these particular practices. This type of approach could have produced more practical value for the future of promoting low-carbon practices.

7 Conclusions

The aim of this study was to examine what factors rural citizens of Finland perceive as limiting or enabling their ability to adopt low-carbon practices. This aim was summarised into two research questions as follows:

1) What barriers do people living in Kauhajoki face when trying to implement low-carbon practices into their lifestyles?
2) What enables people living in Kauhajoki to implement low-carbon practices into their lifestyles?

Eight people with positive environmental attitudes living in the municipality of Kauhajoki were interviewed for the study. The interview data was analysed by utilizing inductive qualitative content analysis and as a result 14 categories of barriers and 13 categories of enablers were uncovered. The barriers and enablers included for example factors related to the physical and social environment that the participants lived in, the availability of services and products, resources of time, money and knowledge, life situation, perceptions of easiness or difficulty, feelings, and health and well-being. Through a closer look at the results several conclusions were arrived at.

The existence of a value-action gap (Kollmuss & Agyeman, 2002) was visible in the results of this study. Despite the positive environmental attitudes of the interviewees their behaviour did not always match their predispositions. A wide variety of factors, virtually almost every aspect of a person themselves, and the physical and social environment surrounding them could act as a factor that has potential to influence their ability to adopt low-carbon practices, for better or worse. Ranging from our inner, oftentimes conflicting, values and feelings, our relationships with our neighbours, and our pay checks to what

the weather's like today, many factors can discourage or encourage us to implement less carbon-intensive practices into our lifestyles.

Rural areas as a context within which people adopt low-carbon practices was especially relevant in terms of barriers and enablers linked to the physical and material environment of these areas, especially issues of infrastructure, and the availability of services and products. Somewhat surprisingly the social context of rural areas, which has on one hand been described as narrow-minded and on the other as community-driven, was not overtly present in the results. In terms of factors of a more internal nature such as feelings, the effect of the rural context was less clearly visible. Thus, applying a place-focused lens on the entirety of the results led to an emphasis of the physical and material factors. This was to be expected as rural areas have for example a distinct type of infrastructure which sets different requirements, and on the other hand different possibilities, for low-carbon practices when compared to more urban areas.

The motivation for this study stemmed from the urgency of climate change, the carbon-intensive lifestyles of Finns, and the consequent imperative for nationwide low-carbon lifestyle change which rural areas face as well. The results add on to previous research on barriers and enablers of sustainable and climate-friendly lifestyle change and solidify the understanding that individuals do not adopt low-carbon practices in a void of free choice. Even though the implications of different residential areas on sustainable lifestyle change have been studied before in Finland, this study prioritizes a balanced look at both barriers and enablers. Based on this study actors in Finnish rural areas can pick out which factors to combat and which to uplift while aiming toward low-carbon lifestyle change.

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Appendices

APPENDIX 1: The lists of low-carbon/sustainable practices presented to the participants during the interviews (derived from Sitra's 100 smart ways to live sustainably)

HOUSING

Heating

- Air source heat pump
- Ground source heat pump
- Lowering the temperature indoors – at home, in empty summer cottage and in other empty spaces (for example storage spaces, unused rooms)
- Proper insulation of windows
- Utilising curtains and blinds better for heating and cooling purposes
- Using floor heating moderately (in individual rooms such as the bathroom)

Electricity

- Self-produced electricity from solar energy
- Buying wind-generated electricity
- Monitoring electricity consumption online
- Taking electricity consumption peaks into consideration ergo relocating your electricity consumption to times of the day when demand for electricity is generally lower

Changes in dwelling location

- Moving into a smaller apartment
- When building new, choosing an energy class A wooden house

Home appliances and their use

- Replacing home appliances with more energy efficient ones

- Changing ”normal” lamps to LED lamps
- Not keeping appliances in standby mode
- Keeping the refrigerator clean

Water, washing up and laundering

- Using a solar collector to heat up water
- Installing a water meter and monitoring water consumption
- Taking shorter showers
- Going to the sauna only once a week
- When laundering: full loads, lower temperatures, and washing clothes less often
- Drying laundry outdoors on a washing line

Recycling

- Sorting waste
- ”No advertisements, please” sign to the mailbox

Using spaces in new ways

- Utilizing the common spaces in your housing company
- Renting the spare bedroom to tourists

MOBILITY

Car’s energy source

- Changing your car into an electric car
- Changing your car into a bioethanol car
- Changing your car into a biogas car
- Moderate use of the block heater

Your own car, a shared car, public transport, or other forms of travelling

- Giving up your own car
- Making your car available for shared use
- Using rental or shared cars for occasional needs

- Ridesharing
- Using public transport
- Trying Mobility as a Service packages
- Riding an electric bicycle
- Walking or cycling regular trips

Minimizing travelling distances

- When searching for a new apartment, moving closer to the workplace, school et cetera
- Combining daily trips (for example commuting, grocery shopping, hobbies)
- Working from home
- Ordering groceries through a home delivery service
- Having hobbies close to home
- Preferring local services

Travelling further

- Giving up flying
- Flying to a closer location (for example replacing a trip to Thailand with a trip to Spain)
- Travelling by train instead of flying

DIET

More or purely veggie-based food

- Switching from red meat (beef, pork, mutton) to fish or chicken
- Having a weekly vegetarian day
- Taking part in vegan challenge or meatless October challenge
- Giving up meat ergo becoming vegetarian
- Giving up all animal-based foods ergo becoming vegan
- Drinking water instead of milk with your meals
- Replacing cow’s milk with plant-based drinks

Preventing food waste

- Rescuing a surplus lunch from a restaurant (for example through ResQ app)
- Buying discount foods that are close to the best-before date
- Buying a ”faulty” food product (such as a curved cucumber)
- Making a shopping list ergo minimizing impulse buys
- Preparing food from leftovers
- Moderate portion sizes (so called one-plate-tactic)
- Preparing only as much coffee as is needed

Local food, organic food and domestic alternatives

- Choosing locally produced food products
- Joining or establishing a food circle in your local area
- Picking berries and mushrooms
- Setting up your own garden
- Choosing organically produced food products
- Choosing potato or barley instead of rice
- Choosing Finnish lake fish instead of cultivated fish

Cooking and belongings

- Preferring microwave, kettle, or induction stove (avoiding the use of oven)
- Using your own shopping bags
- Carrying your own water bottle

APPENDIX 2: An example of the analysis process

An excerpt from interview number 2 (discussing plant-based food):

"Well, probably because I have grown up with meat courses: meat, fish, chicken, eggs, cheese, all these animal-based products have been a part of it and I have gotten used to, that they are good and taste good, I know how to prepare them, so, in that way giving them up totally feels a bit useless to me. I think about food more from the point of view of my own health than from the point of view of the environment. And when I think of it from the point of view of my health then a part of it is that I eat more vegetables and fish and so forth, but the ideology behind it is more about health than the environment."

Meaning unit	Analysis	Code	Analysis	Category
"I have grown up with meat courses"	*P2 has been eating meat since her childhood which has normalized meat eating for her.*	Personal background (barrier)	*Personal background is related both to previous life situation and previous experiences.*	Life situation and experiences (barrier category)
"have been a part of it and I have gotten used to"	*Similar to the previous one but the act of getting used to implies more clearly that eating meat has developed into a habitual practice.*	Habitual behaviour (barrier)	*Related to the habitual nature of practices and how they can become locked-in.*	Locked-in habits and thoughts (barrier category)

"they are good and taste good"	*P2 thinks that meat courses are tasty which makes them pleasant to consume.*	A sense experience (barrier)	*To like something is to prefer something; Preferences have similarities with feelings as they derive from the inner worlds of individuals.*	Feelings and preferences (barrier category)
"I know how to prepare them"	*P2 has the skill to prepare meat courses which makes preparing them simple and familiar.*	Familiar ways of acting (barrier)	*As P2 is familiar with preparing meat courses, she may not want to learn new plant-based recipes; It is easier to stick with old recipes.*	Locked-in habits and thoughts (barriers)
"giving them up totally feels a bit useless to me"	*The aforementioned barriers may induce this feeling, but I think that this still deserves its own code as feelings, however they are induced, can act in powerful ways.*	Not convinced (barrier)	*As mentioned before, I feel that feelings have similarities with preferences, that is why they are grouped together here.*	Feelings and preferences (barriers)
"And when I think of it from the point of view of my health then a part of it is that I eat more vegetables and	*P2 incorporates vegetables into her diet but does it because of her health and not necessarily because of*	Healthy low-carbon practices (enabler)	*To me, health considerations did not seem to fit in with other enablers which is why*	Health and well-being (enablers)

fish and so forth, but the ideology behind it is more about health than the environment.”	*environmental concerns; An alternative code could have been e.g. “alternative motivations”.*		*I decided to create a separate category for them.*	

APPENDIX 3: A more comprehensive sample of quotes within each barrier and enabler category

CATEGORY (BARRIER)	QUOTE (PARTICIPANT AND CODE)
Availability of services and products	"I cannot rely on public transport for mobility during the workday or nowadays even for commuting home, as it is quite weak." (P1, deficiencies in public transport) "Hobby opportunities have decreased in the village over the years, they have concentrated in the centre of the municipality." [on having hobbies close to home] (P1, services centralizing) "But in my opinion local food could be brought forward in the same way, displayed better like "here they are". Now [local meat company's meat] is among all the others from where it has to be searched." (P2, low-carbon products not well-displayed) *NOTE: Although here meat is used as an example of local food, applies to low-carbon food products as well.* "If you think about transporting your bicycle in public transport, it should be made more acceptable and easier." (P3, combining modes of transport is difficult) "Well, maybe these faulty food products, they are necessarily not available, at least here in the countryside, they are not as a separate choice." (P4, low-carbon products unavailable)
Infrastructure and technology	"But then if there is some other errand in addition to work that has to be done in the centre, going by bicycle just does not work." (P1, practical limitations of vehicles)

	"…I had joined or downloaded the ResQ app, but it never chimed so I never remembered it. So, I would blame the app for not using it." (P1, unfunctional technology) "…my wife could use bioethanol but there is no fuel station for it in Kauhajoki." (P5, insufficient infrastructure) "It is a fairly new set-up [of oil heating] so it is a bit awkward to do anything new after it." (P6, existing building structures) "So, the only thing that we do not currently recycle is biowaste. It is not collected separately in Kauhajoki." (P8, shortcomings in waste management) "…in here distances are longer, in cities they [shared/rental cars] can be at the side of the marketplace for the taking but think about the situation here." [on carsharing] (P8, long distances)
Outside conditions	"…even if I had [an electric bicycle] those worse weathers do still exist [and public transport cannot be relied on] so it is so that we cannot give up that one car." (P1, includes weather conditions) "This winter there has been the problem of little snow fall, followed by rain and the consequent ice fields." [on electric bicycles] (P4, slipperiness of roads because of the weather)
Attractiveness of rural space	"It could be quite fun but there probably would not be a huge rush here." [on renting the spare bedroom to tourists] (P2, rural areas unattractive as holiday destinations)
Other people	"And I am not that kind of, how do you say it, annoying person who judges other people's eating habits. [laughter] I try to mind my own business with these things." [on plant-based eating] (P1, social norms)

	NOTE: This interpretation does not mean that the participant's behaviour is in no way wrong. It is aimed more at the general atmosphere where vocalizing concerns over current meat-based diets can be instantly viewed as being "judgy". "I have had soy mince in my cabinets for a long time, we put it in foods with minced meat, my wife is not that excited about it, she does not like its taste." (P4, close relationships [also linked to taste preferences from the wife's point of view]) "…I have probably never done ride-sharing. There has not been any acquaintance in my close circles who would have had the same schedule as I do." (P7, acquaintances [more precisely, the lack of them])
Financial viability and sensibility	"Or then it can be disproportionately expensive" [on lake fish] (P4, low-carbon practices expensive) "…solar energy would be interesting but to my understanding it is not a very cost-effective way to, to my understanding it is just too expensive." (P6, low-carbon practices not cost-effective) "If the car was completely electric, I would not necessarily yet have the money for it." (P7, limited wealth) "…it could become financially more expensive. Because you would have to sleep somewhere, eat and the sorts." [on travelling internationally by train instead of flying] (P7, low-carbon practices not financially sensible)

Knowledge	"…this is connected to district heating and my knowhow does not go so far that I would be able to evaluate whether it would be sensible to propose solar collectors or such to the housing company, I would need considerably more information before doing it." (P2, lack of knowledge) "On that air source heat pump, I think that there have been so few studies on it as of yet…" (P3, poorly available information)
Limited time	"…with a busy life you do the laundry when you have time for it" [on taking electricity consumption peaks into account] (P7, the limited nature of time) "Going by train instead of flying has to do with schedules, if you have a short summer holiday and want to go somewhere – it takes a lot of time." (P7, low-carbon practices taking more time) "Then you have hobbies and the sorts, and there is not enough time for me to go around the store and read the side of every pot." [on general consumption of products] (P8, low-carbon practices taking more time)
Locked-in habits and thoughts	"People here are used to driving so it is not a big deal for them." [on having to drive to get to hobbies] (P1, habitual behaviour) "…I know how to prepare them…" [on meals that have meat in them] (P2, familiar ways of acting) "Shared use of a car, that is kind of a foreign idea here in the countryside." (P3, ideas seem unfitting to the current situation)

	"Or it might be that they cycle once a week for exercise, so bicycle is mainly an exercise equipment for them." (P4, old mindsets)
Life situation and experiences	"I live in a row house that is connected to district heating. And this is a housing company of two houses so I alone cannot really – make the sort of decisions that something big could be changed just like that." (P2, living in a row house) "Well, we have noticed in practice that lower temperatures [while doing laundry] are not necessarily that good." (P4, previous negative experiences) "In this family food thing, what we eat together at home, it is not just a choice of an individual but instead a joint decision of the whole family." (P4, living with other people/having children) "Working from home is not yet possible in [their profession]." (P5, obligations at work)
Perceptions of difficulty and distance	"…technology has creeped so well into people's lives that they do not remember, or the environmental mark is not really visible because some cobalt mines are somewhere far far away." (P1, environmental issues seem distant) "That little amount of milk that I use, I can use as [cow's] milk." (P2, own actions perceived as insignificant) "…in practice you have to have your own car here, especially if you do not live in the centre…" (P4, insurmountable need)

	"…I have a principle that I do not want to make my life, in a way, too difficult." [on low-carbon lifestyles in general] (P7, low-carbon actions require effort)
Feelings and preferences	"But maybe it is some kind of…avoidance of desperation." [on environmental issues in general] (P1, avoiding negative emotions) "[recycling station] is the meeting spot of "tractor youngsters" -- affects the pleasantness of doing the final part of the sorting process. If ten tractors rumble next to you, it feels that you are there in display." (P4, negative emotions) "…I am an introvert type of person so I would not accommodate a stranger on my couch, I would rather be in peace, close my door and not talk to anyone [a humorous tone]." (P7, need for privacy) "And I must say that in the school I think we have carrot patties so it is not the best food, my child also always says at home that it is the worst meal in school." (P8, a sense experience)
Conflicting issues	"…I have replaced home appliances in the last couple of years but to me energy efficiency is not the final [most important] thing." (P3, low-carbon not the priority) "…there is just that thing that you do not get support, and social interaction has to be gotten from someplace else." [on working from home] (P3, harmful side effects) "There are the environment, climate and being ecological, but then there is being ethical, there are so many values that should all be taken into account." (P7, conflicting values [or values perceived as being in conflict])

Health and well-being	"My diet has changed into an even more vegan direction but not like…how do you say it…very rigorously and instead in a smaller way, but it has perhaps been affected by my stomach." (P1, physical well-being) "…understanding of nutrition, so in the end it is quite hard to get diverse nutrition from a purely plant-based diet, at least if you also refuse milk and eggs too." (P4, worry about health) *NOTE: The statement could also be linked to old mindsets or even lack of knowledge, when it comes to vegan diets.*

CATEGORY (ENABLER)	QUOTE (PARTICIPANT AND CODE)
Availability of services and products	"[on availability of plant-based products] That is actually pretty good, they can be found in the two bigger stores. I think that during the last ten years there has been a leap forward in their assortment, I would even claim that three years ago there was not the same number of soy, oat, and such milks. Sure, more plant-based products have come to the market but still the number of choices is quite large." (P1, low-carbon products available) "Bus connections from here to Seinäjoki are quite good." (P5, functional public transport) "…those Reko events [food circle for local food] are held here…" (P7, services enabling low-carbon practices available) "[on low-carbon driving] …indeed, if that biogas plant is made operational then it enables that." (P7, possibility for local production of biogas)

Infrastructure and technology	"[on consumption of things] But luckily there are lots of those where you can recycle or gift to others, like these "dumpster"-groups [*roskalava-ryhmät*] in Facebook and such, they work well also here in the countryside." (P7, social media) "[on plastic recycling points] Plastics have not been here in Kauhajoki for long, one year maybe." (P8, adequate/developing infrastructure) "But in the future, I would not see solar panels as a bad alternative, we could also have those on our roof. -- Yes, they have become more common over the last few years. -- Yes, and their prices have come down." (P8, developing technology)
Rural space	[most quotes already in the main text] "I think that this "city-countrymen" [*citymaalaiset*] is pretty funny, those who get common holiday homes in rural areas that then act as holiday spots for many people." (P1, rural areas as holiday destinations)
Political measures	"…to my understanding there is still no VAT type of tax on international flight tickets and the fuel tax is also non-existent. So that should be stopped globally, or let's say, tax benefits of air travel should be reduced." (P4, increasing taxation of carbon-intensive practices) "…then of course we chose ground source heat pump. I think there was a form of energy subsidy for it." (P7, financial incentives)

Other people	"[on recycling] I am in a lucky position as we have someone at home who is well-versed in it -- she has done some studies in sustainable development and such so I get knowledge from her anytime I need it." (P3, close relationships, also linked to knowledge) "…I have friends who eat plant-based, so I had to get acquainted with different plant-based drinks." (P7, close relationships/acquaintances) "[on adopting a plant-based diet] if culture changes into that direction then I am okay with it." (P6, possibility of cultural norms changing)
Financial sensibility and frugality	"…I will probably never have enough financial resources to fly to somewhere like Thailand or America." (P2, limited wealth) "[on reducing consumption in general] Yes, and then of course everything because you have to pay for it." (P3, general frugality supporting low-carbon practices) "…ground source heat pump is a big investment but our heating expenses reduced markedly after it." (P5, low-carbon practices profitable in the long term) "[reducing food waste] it is also a financial matter, so that money is not wasted." (P4, low-carbon practices financially sensible) "[on organic produce] I somehow think that it is better even though it is more expensive, often it is so that I am not ready to bargain when it comes to food." (P8, low-carbon practices not a question of money)

Knowledge	"…because there is more to driving than just the fuel, the tires always produce [me helping to come up with the word] microplastic." (P3, having knowledge about environmental issues) "Because it [electricity meter] is on the wall of the hallway you can notice that "aha, the floor heating switched on" and then if you feel like you do not really need heating there you can go check which thermostat went red and switch it off." (P4, information being easily available)
Time	"I have told my spouse that she does not need to take on a job that is far away for small financial gains, it always reduces free time after all." (P3, low-carbon practices saving time) "…we have been thinking with my daughter who has this ResQ app and does not ever have time to pick up the meals because of work. So, we could do it so that I who am here at home could order the meals and then we could get them for both my daughter and me." (P2, having time)
Forming habits	"I have always a back-up tote bag in my car in case I forget to take one." (P2, being prepared) "[on recycling] so that is something that I could not even give up now that I have done it [for so long]." (P4, already-formed, self-evident low-carbon habits) "…then of course if there would be very many plant-based days then I could in principle give up meat entirely." (P5, habits as steppingstones)
Life situation and experiences	"…being from a poor family these were always self-evident things that have been a part of life, meat was so expensive that it was reserved for special occasions. Food was not wasted and everything, starting from electricity, was saved." (P2, personal background)

	"…sometimes I feel like moving into a smaller apartment now that the kids have moved away from home." (P5, children moving out) "I have dreamt of putting a kind of rack there [on the large deck] for laundry and such." (P7, having one's own yard) "Once our refrigerator stopped working precisely because we were told that there is no need to, it cleans itself. -- After that we have from time to time cleaned it manually." (P7, learning from past mistakes)
Feelings, values, and preferences	"…I think that clothes smell lovely after they have been dried outdoors." (P2, sense experience) "And I do not fly at all, out of conviction." (P3, environmental and ethical values) "And public transport when I travel on my own, it would not be nice to drive alone." (P4, high-carbon practices feel unpleasant) "I am not an avid sauna goer…" (P7, personal preference) "[on utilizing food scraps] Then I do not think about what I would like to put in it but just put everything that I have." (P7, rejecting personal preference)
Perceptions of easiness and sensibility	"…if we did not aim for pure plant-based eating but instead increased the amount of veggies in each meal. Then you would not need to wage a war against other people." (P6, giving something up partially)

	Well, sometimes I buy discount products if I know that I will use them immediately. But I will not buy them for no reason." (P7, sensible low-carbon practices) "If we travel within Finland to let us say Helsinki, we go by train as a family. It makes it easier to move around there as you do not have to think were to put or keep the car." (P8, convenient low-carbon practices)
Health and well-being	"…it [an electric bicycle] is not a moped so you get exercise…" (P4, healthy low-carbon actions) "To my understanding it seems that all reasons point to the same direction, there are health-related reasons…" [on plant-based diets] (P6, healthy low-carbon actions)